

VOL. XLIV No.5

MAY 1959

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MAGAZINE



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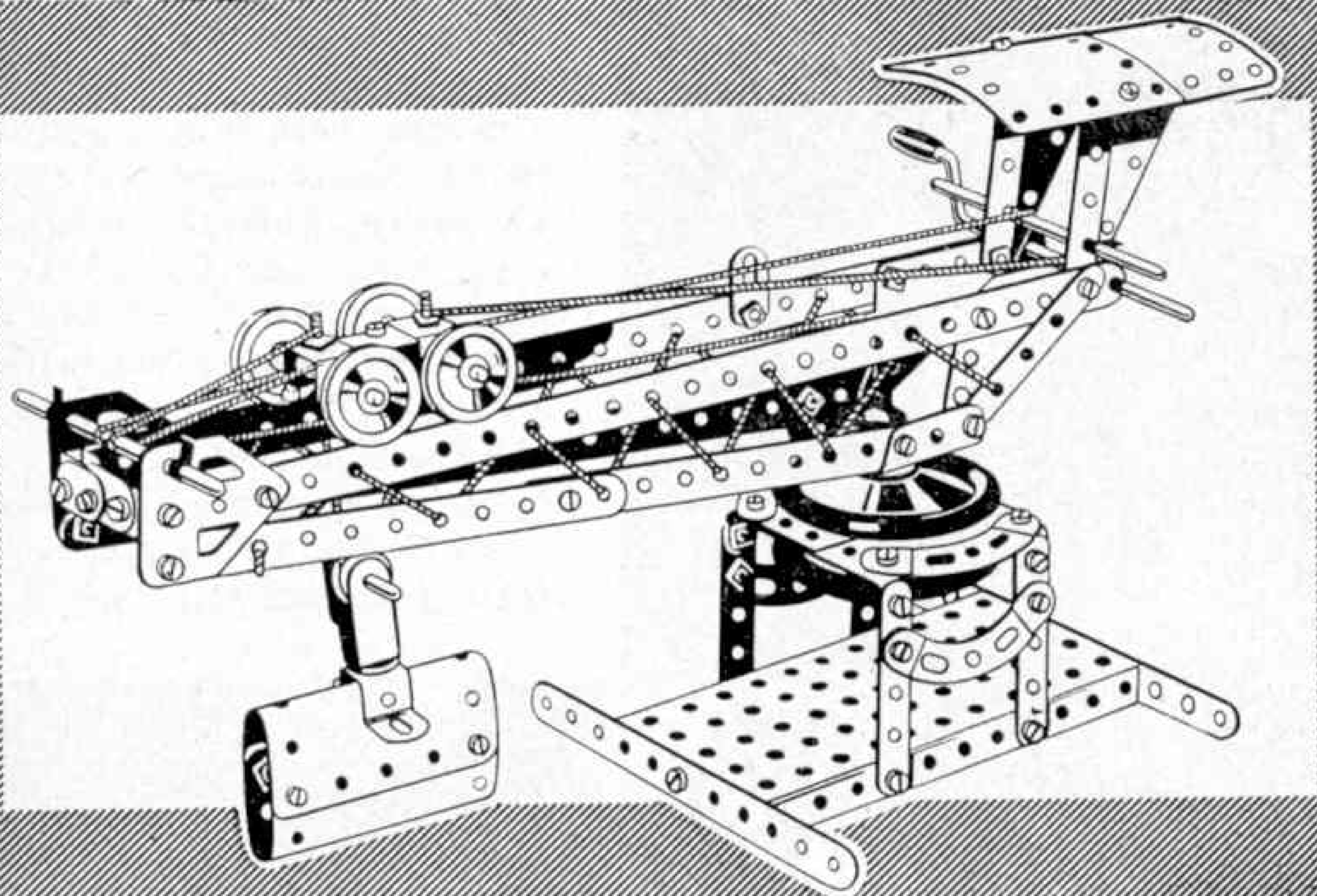
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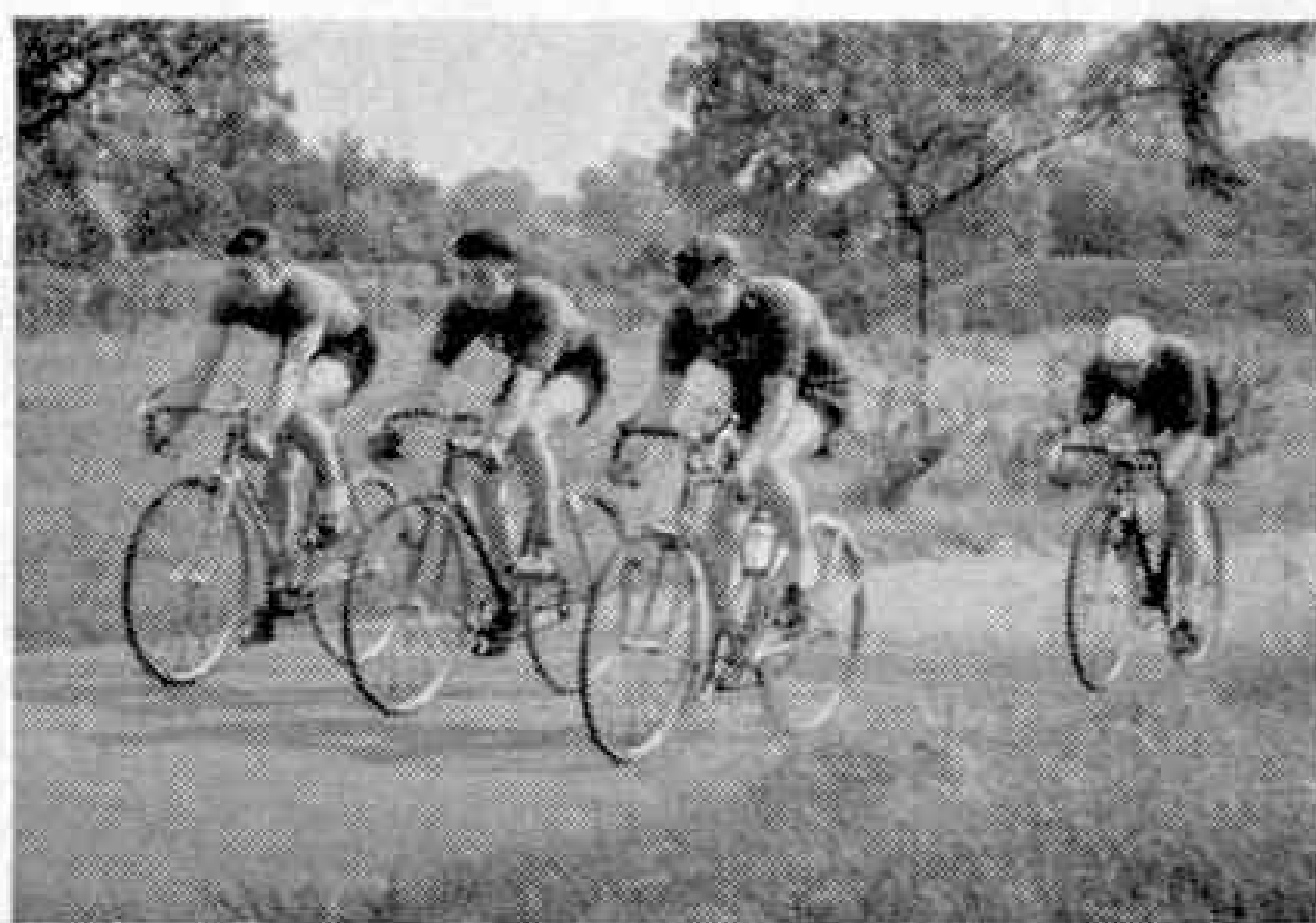
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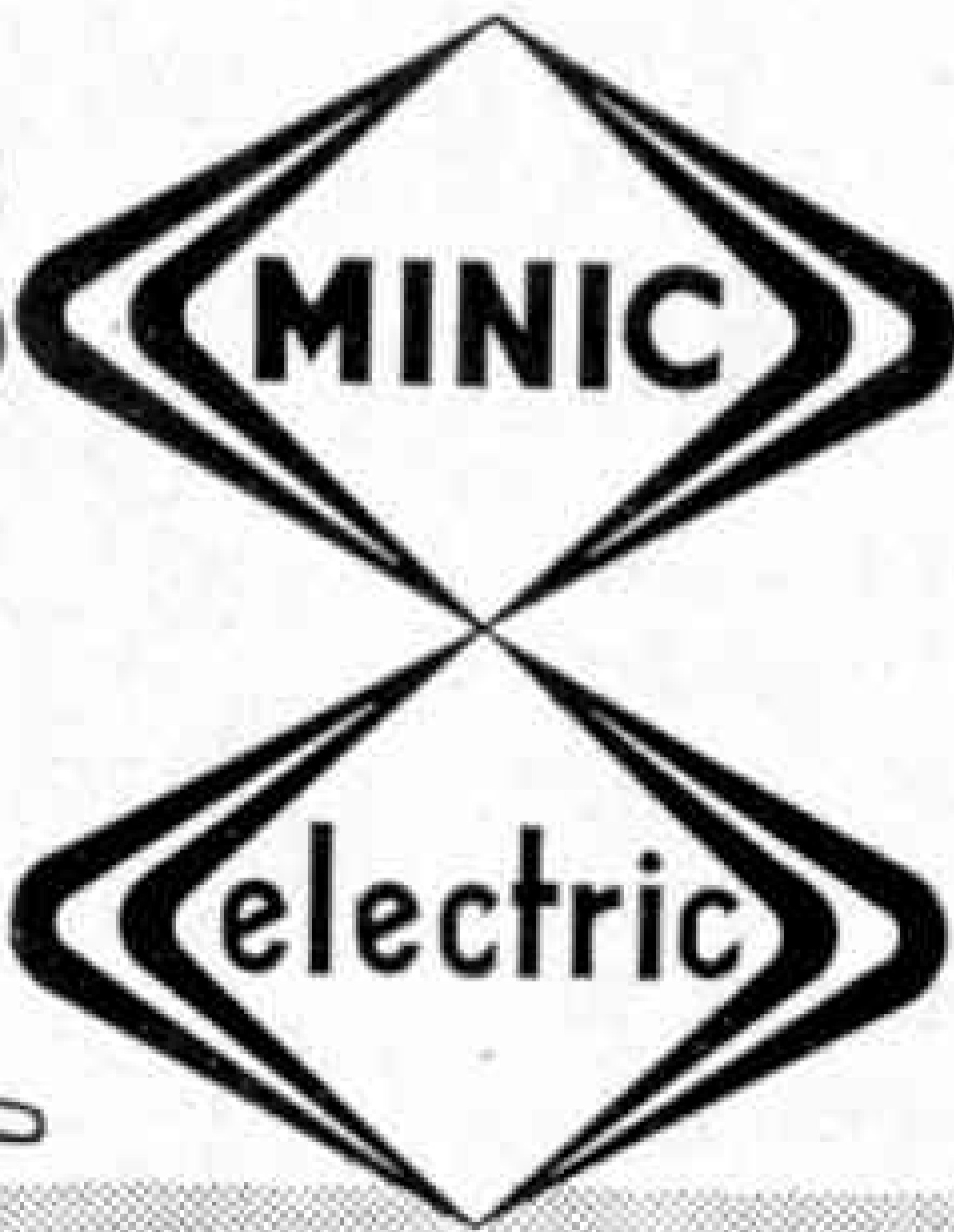
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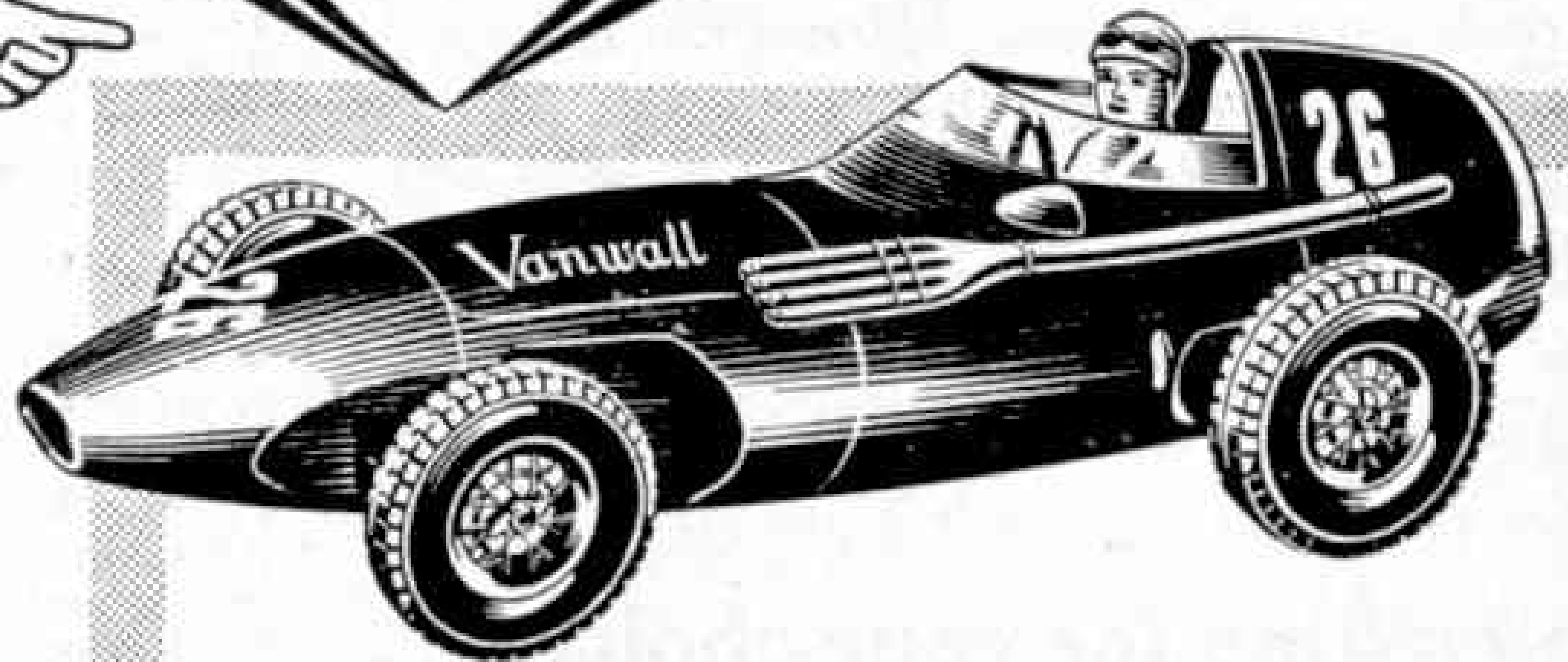
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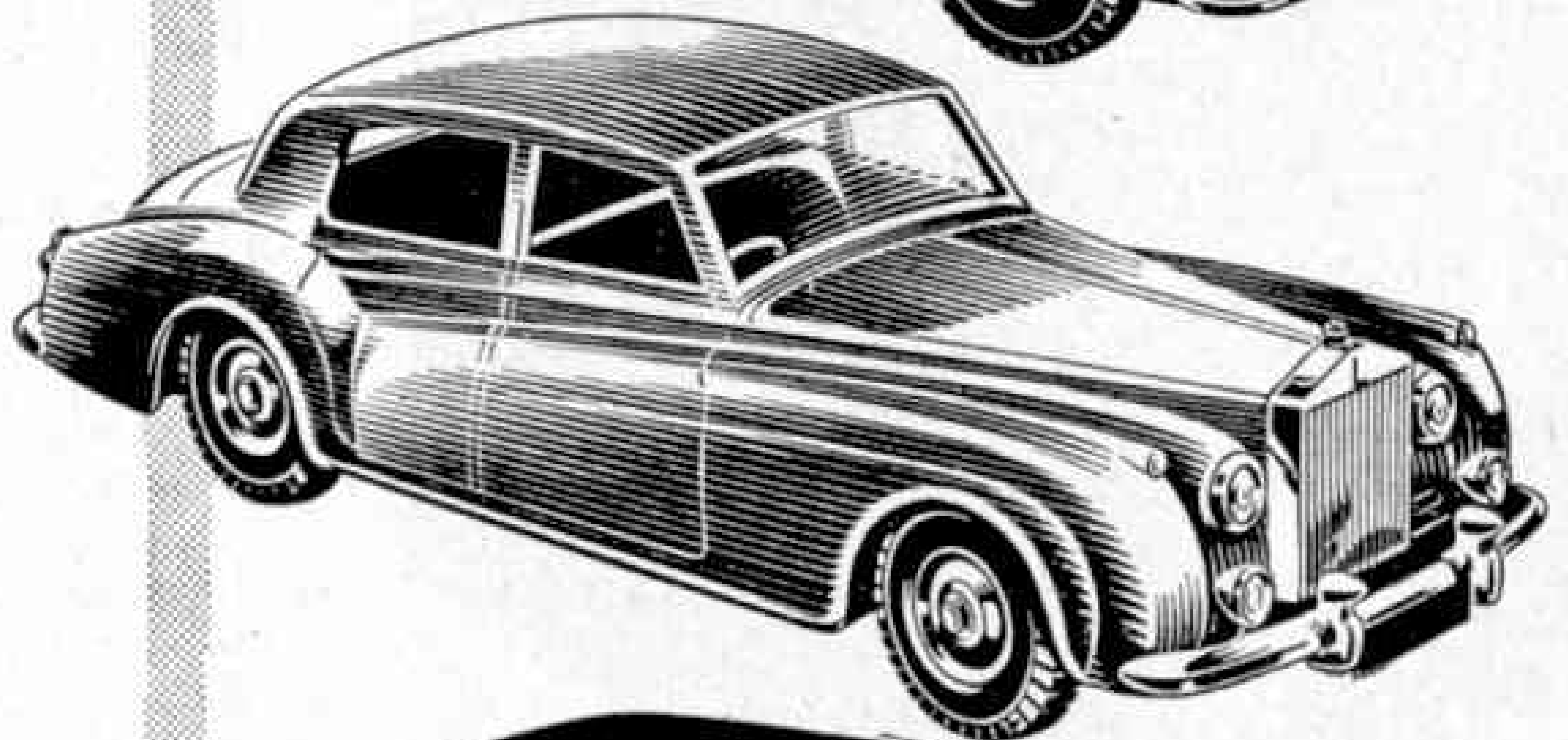
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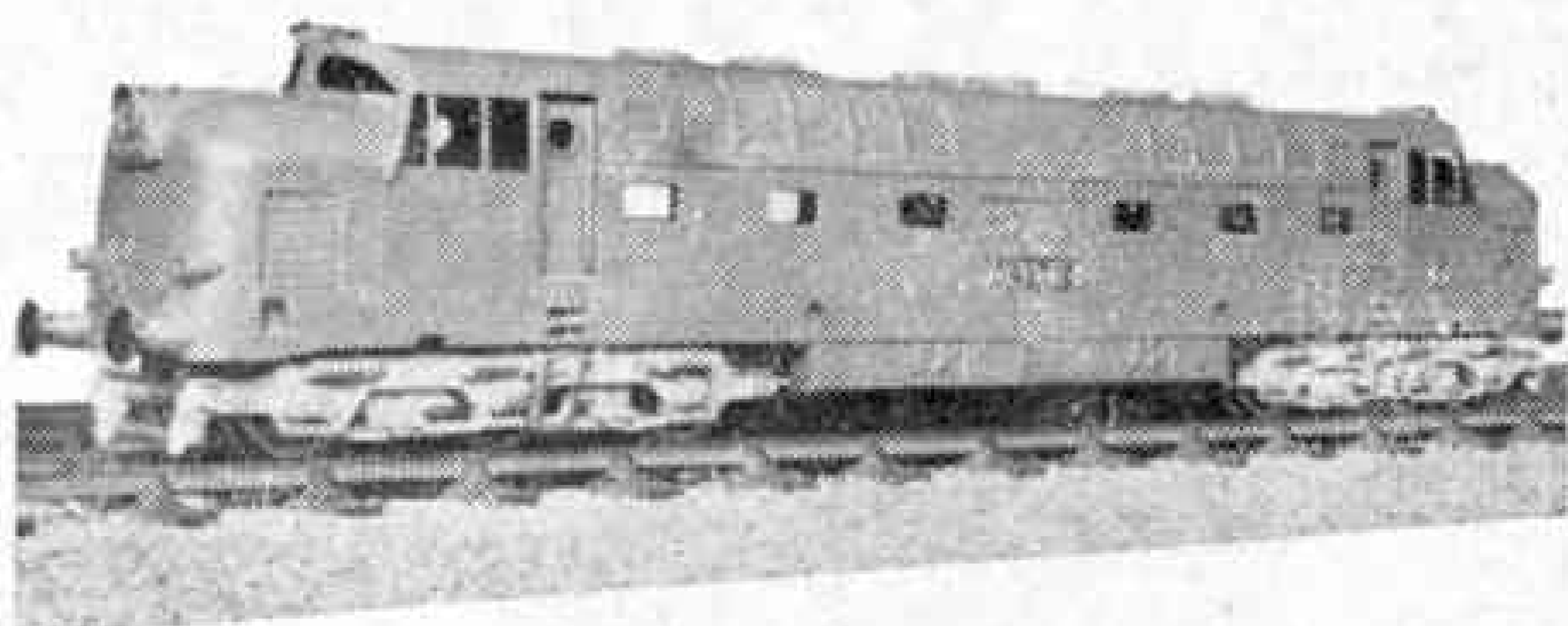
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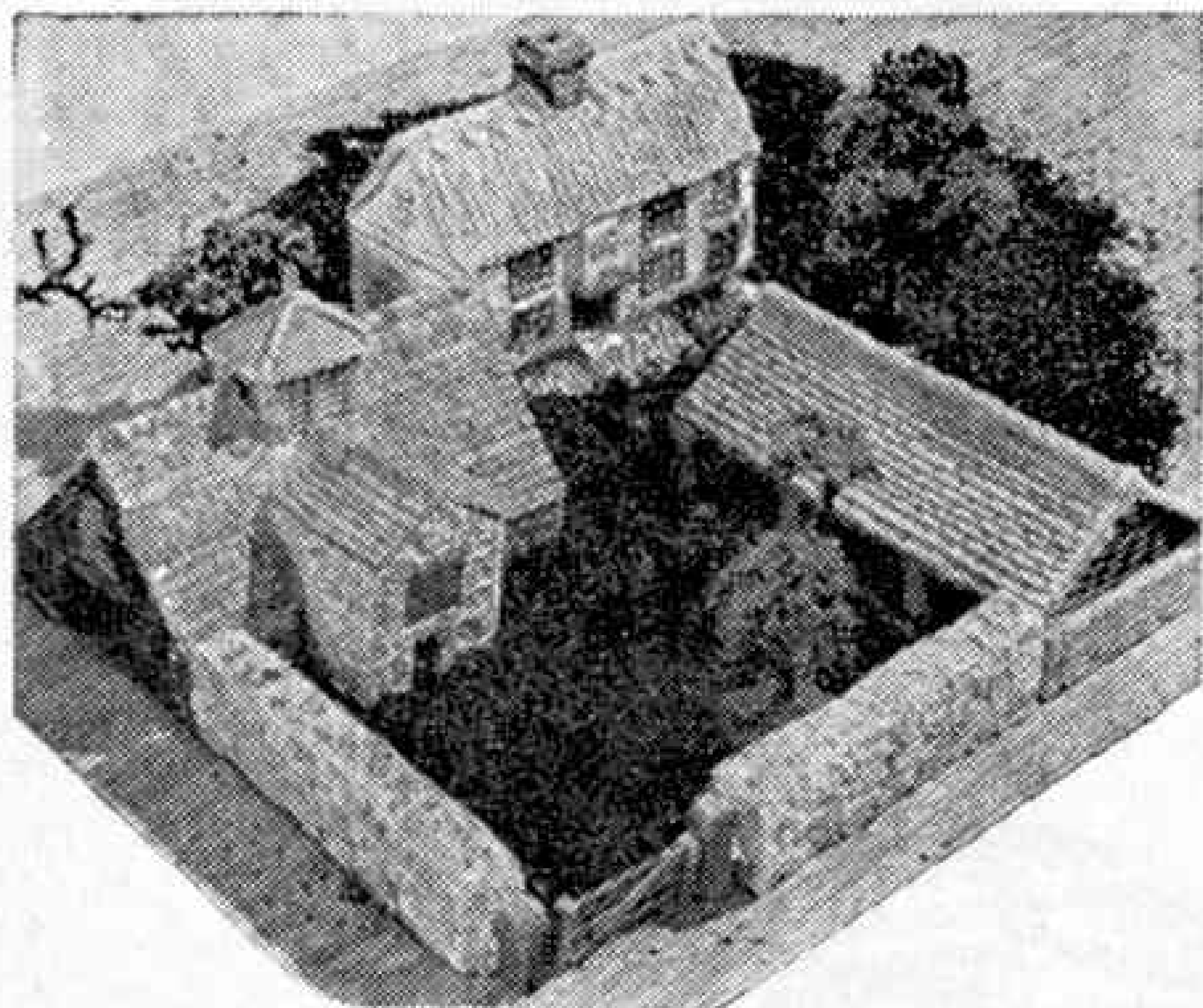
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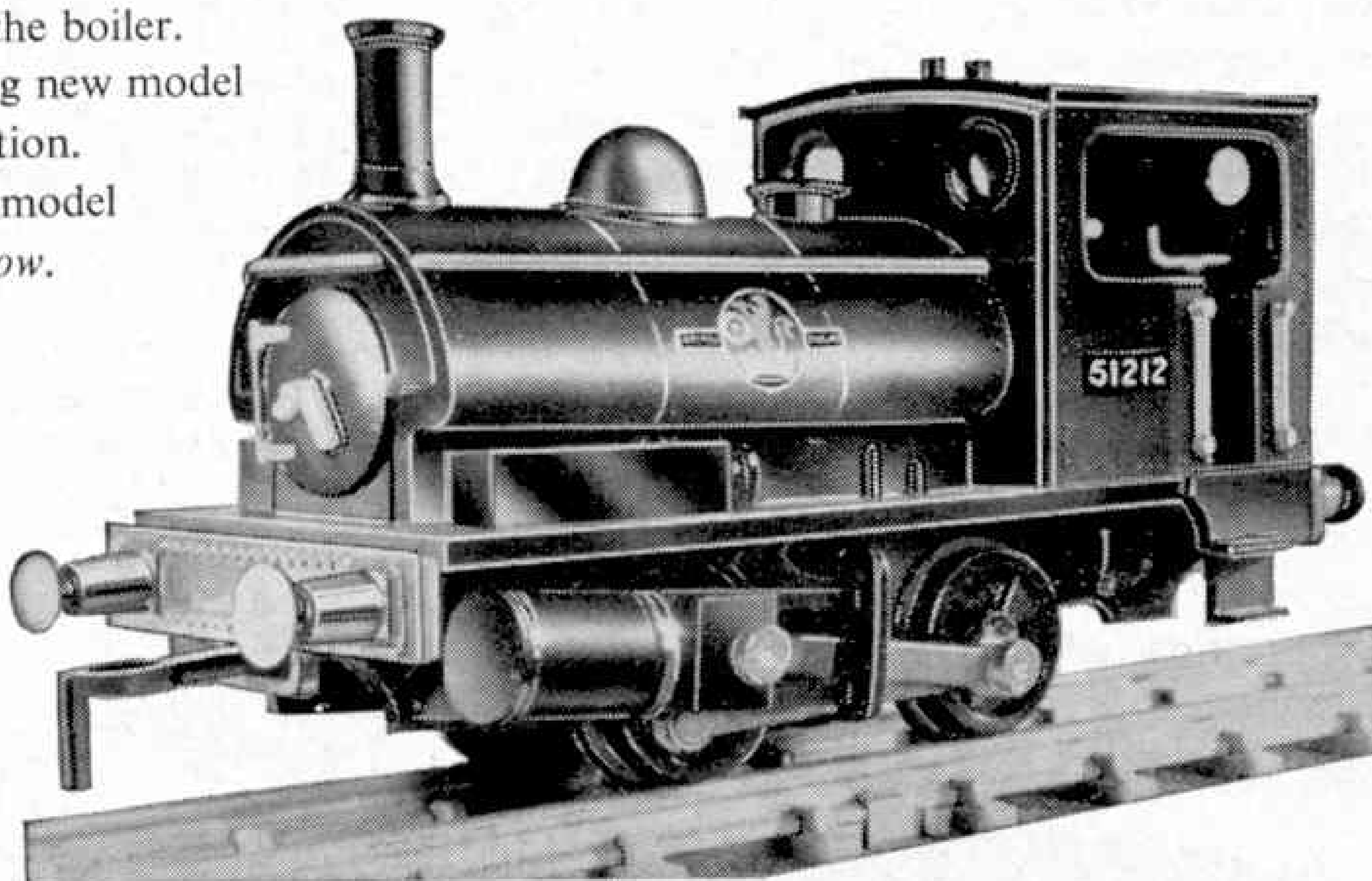
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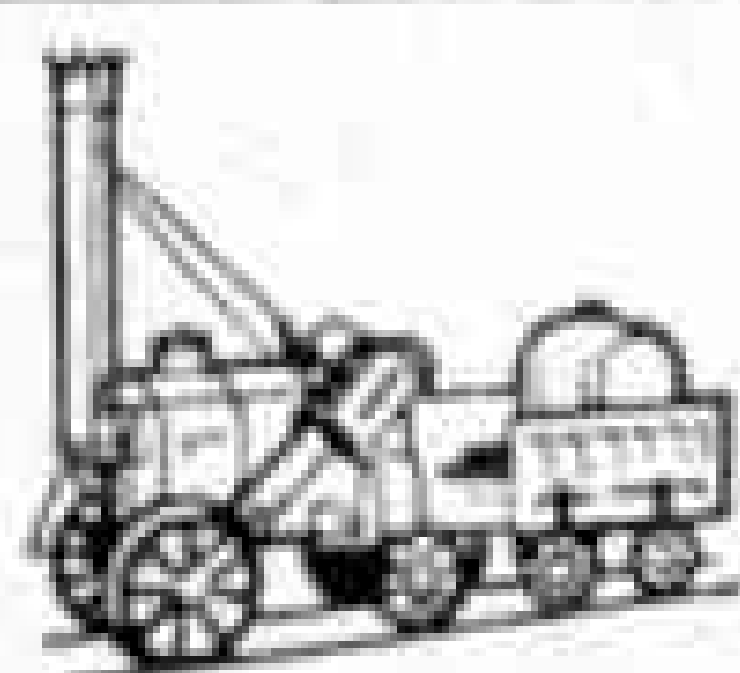
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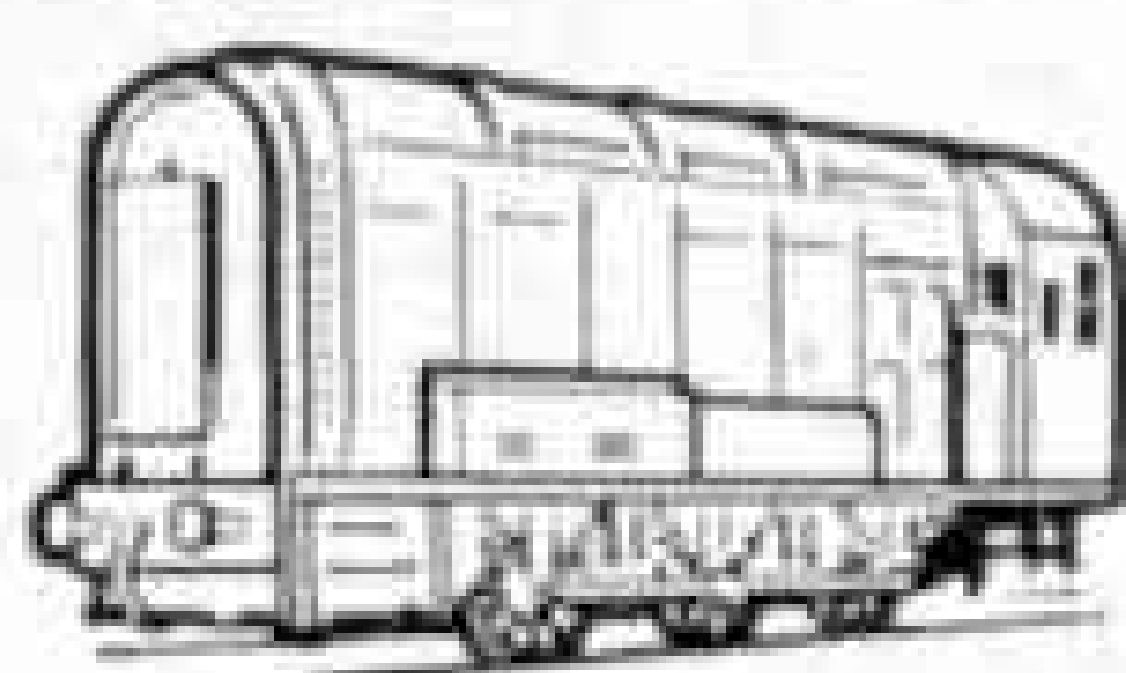
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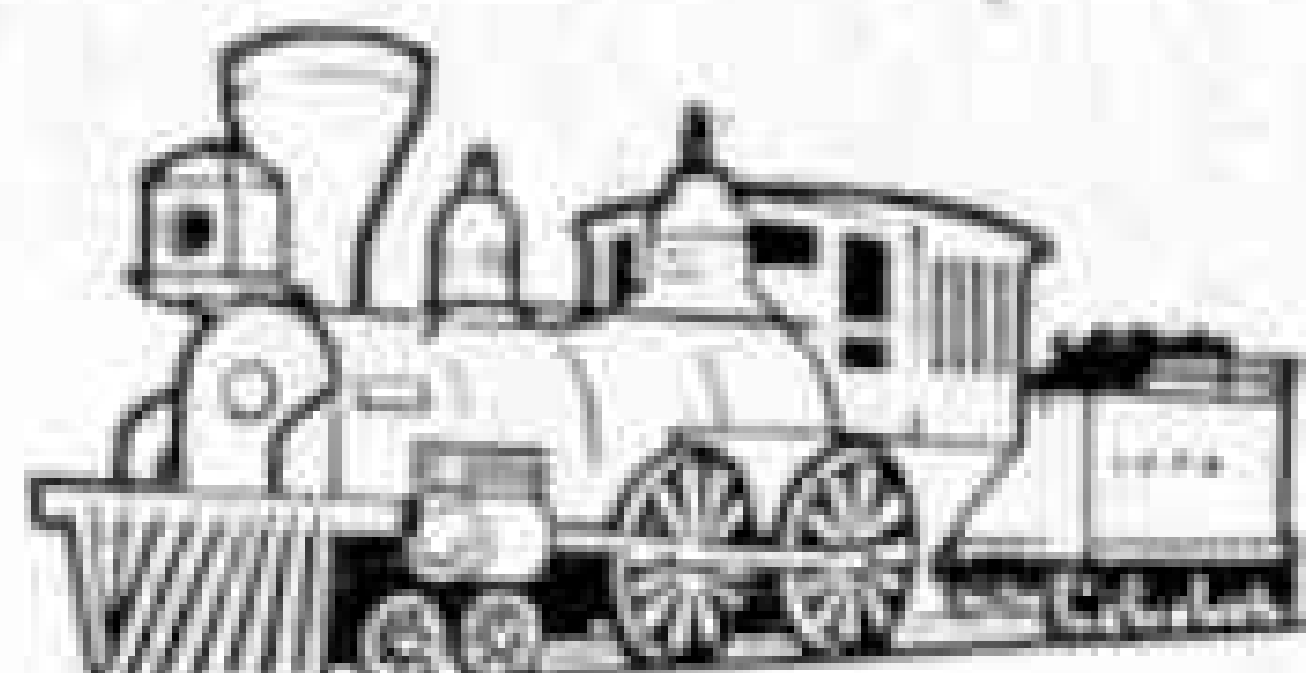
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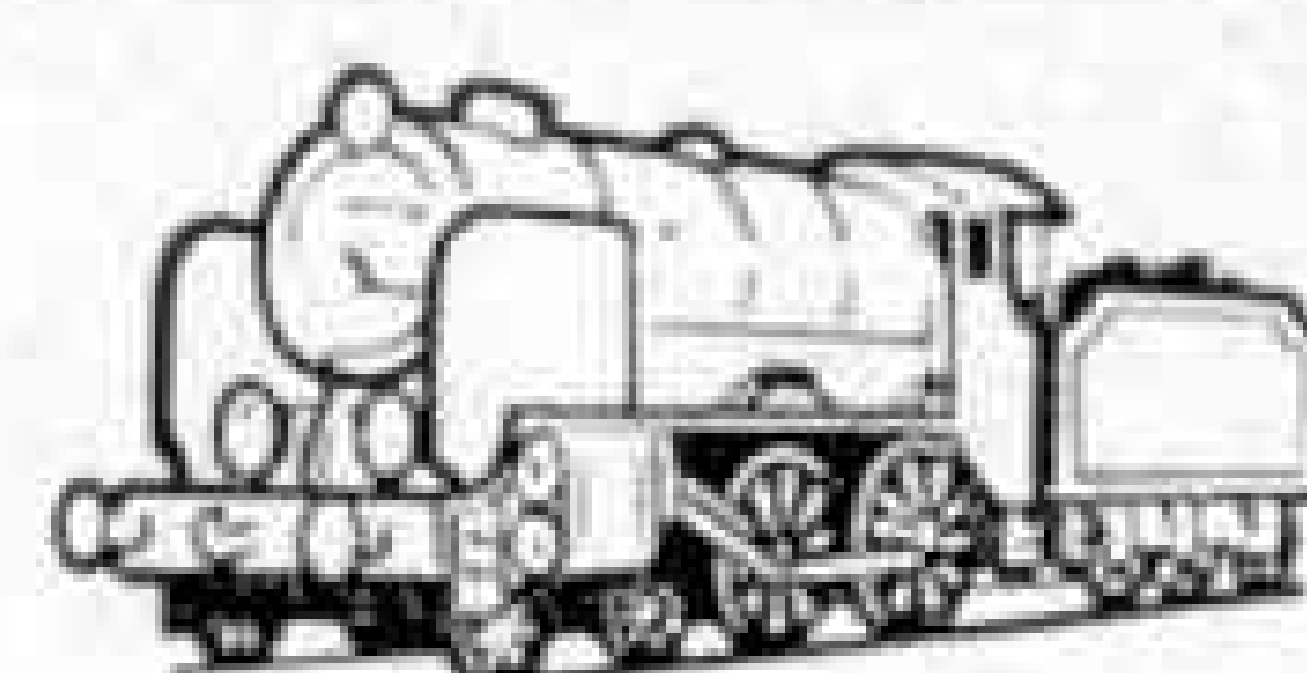
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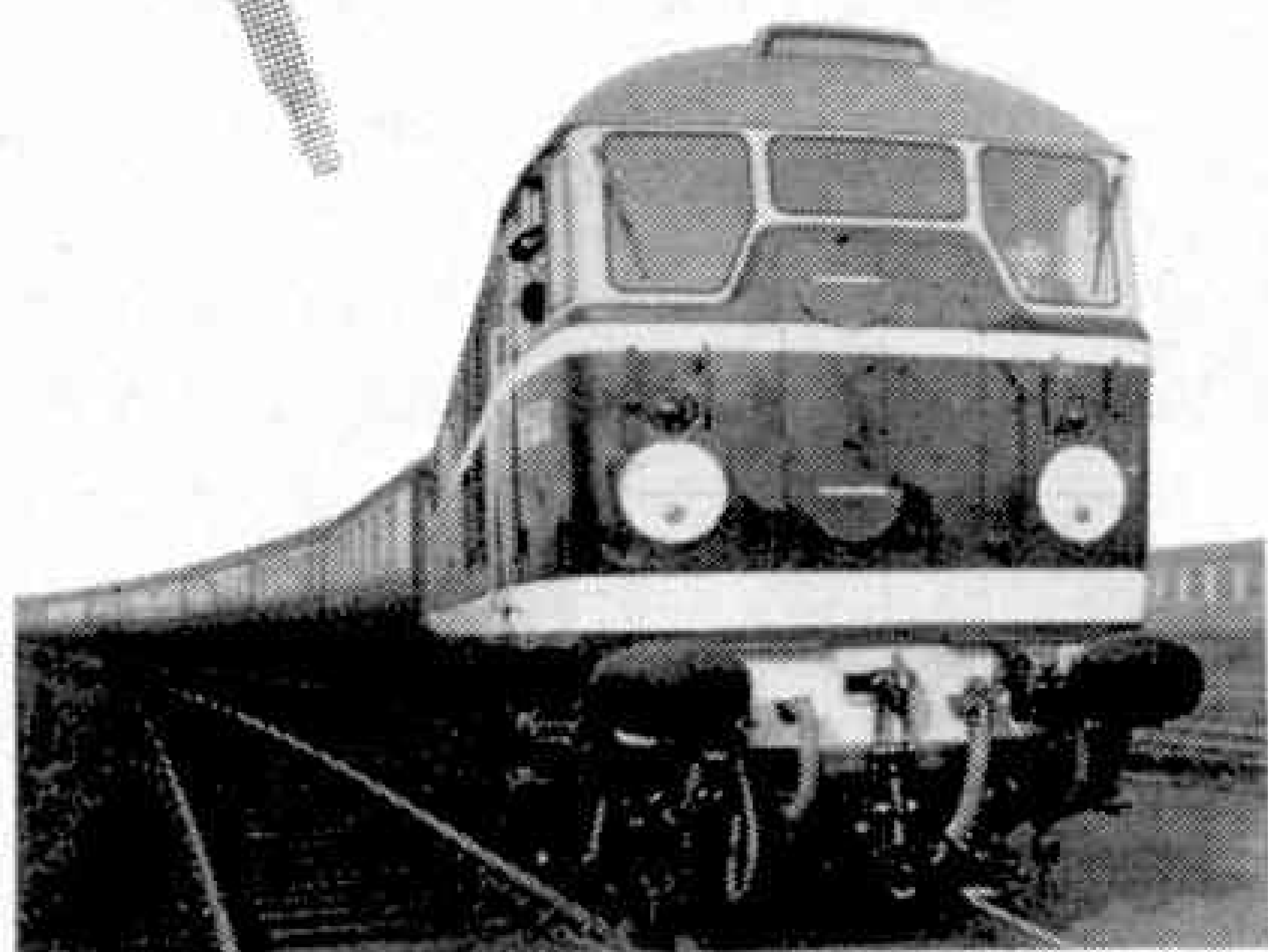
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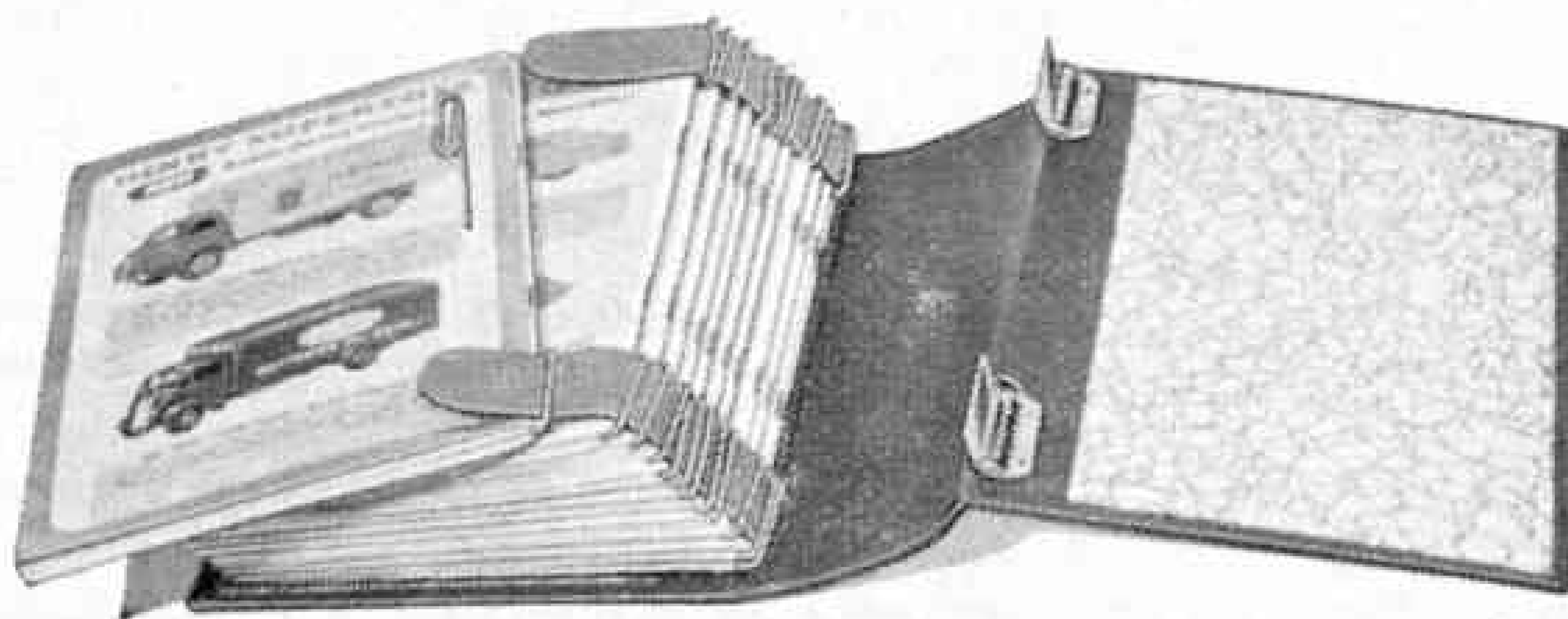
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Next Month: "SOME STRANGE INVENTIONS"

MECCANO

MAGAZINE

Editorial Office:
Binns Road
Liverpool 13
England

EDITOR : FRANK RILEY, B.Sc.

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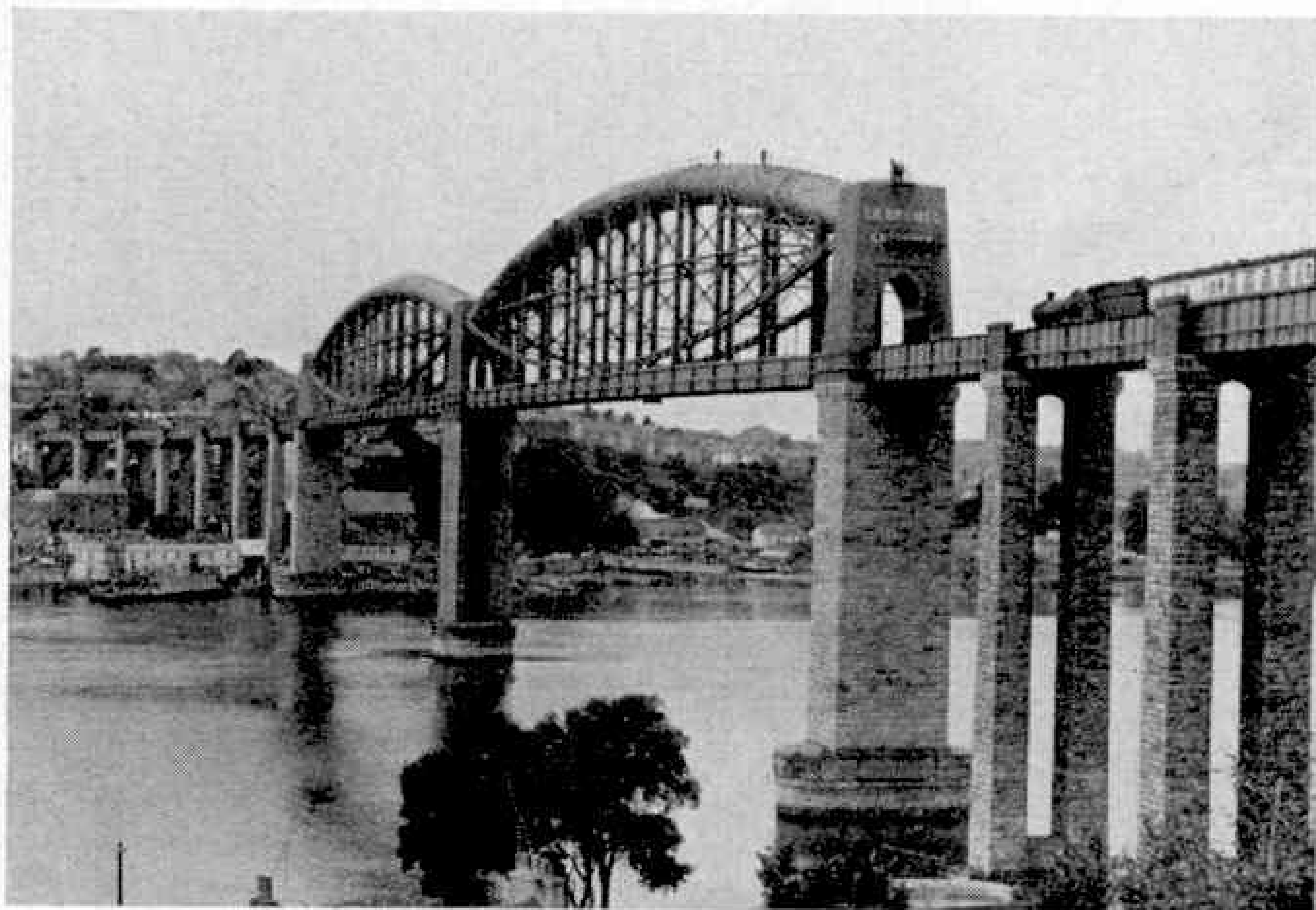
A Hundred Years Old on Sunday

MOST of you will have recognised the bridge illustrated on this page. It is the Royal Albert Bridge at Saltash, the last masterpiece of that great pioneer engineer, Isambard K. Brunel. I have included the

figures of men on top of the nearer of the two trusses.

Some of us today have been rather surprised to find that this famous bridge has only a single track across it. I suppose

that if it had been built today a double track would have been provided, and possibly a roadway as well. Big bridge building is easier today than it was 100 years ago, for our present resources are much greater and engineers have behind them a larger mass of knowledge and experience. Brunel indeed contributed greatly to the latter. He was always enterprising and ambitious, as he showed by building the *Great Eastern*, the famous



Brunel's masterpiece, the Royal Albert Bridge, the centenary of the official opening of which falls on the 3rd of the present month. This fine photograph of the bridge is by A. W. Besley, Paignton.

picture this month because the bridge was opened on 3rd May 1859, so its centenary comes two days after the publication of this issue.

The bridge carries what is now the line of the Western Region of British Railways across the River Tamar, which here separates Devon from Cornwall. At this point the depth of the river at its centre is about 70 ft., so that the construction of the central pier was a matter of no mean difficulty. The bridge is indeed a mighty structure, as can be gathered from the tiny

steamship that was far ahead of its time so far as size and design were concerned. And it seems that he was looking well ahead when his Royal Albert Bridge was built, for when he saw it after completion he is said to have exclaimed that it was a pity it had not been made with double track and a road as well. Many of those who have had to wait to cross the Tamar at Saltash by ferry must have echoed this comment.

The Editor

"The Caledonian"

By "North Western"

THE cover to this issue of the *M.M.*, prepared from a B.R. London Midland Region photograph, presents a fine study in colour of *The Caledonian*. This train provides a speedy "limited" service between London, Euston, and Glasgow Central, leaving the latter city at 8.30 a.m. and Euston at 4.5 p.m. It is operated jointly by the London Midland and the Scottish Regions, covering the 401.4 miles between London and Clydeside at something under the mile-a-minute pace.

The Caledonian was introduced in June 1957. The schedule was then 400 min. for the journey in each direction, but the importance of engineering works in progress on the Euston-Crewe main line in connection with the electrification of this section has since caused a general easing out in the timings of expresses to and from Euston. Thus *The Caledonian* now has an additional quarter of an hour each way in which to complete its run.

In providing this service, with an intermediate stop at Carlisle in each direction and with its "booked seat" accommodation distinctively upholstered and carpeted, *The Caledonian* resembles somewhat the pre-war streamlined blue-and-silver *Coronation Scot*, a specially speedy service introduced in 1937 which ran up to the outbreak of the second World War. *The Caledonian* of today, with its eight coaches in B.R. maroon, makes a brave show, particularly if the engine used is one of the number of L.M.R. 4-6-2s that have been painted in that colour in place of the more usual B.R. green. The engine on our cover, No. 46244 *King George VI*, is one of these.

These Stanier 4-6-2s quickly began to revel in the running conditions of *The Caledonian* and a few months after the introduction of the service in 1957, No.

46244 was the locomotive hero of a remarkable run which resulted in the up train arriving at Euston 6 hours 3 min. after leaving "the Central" at Glasgow, 37 min. early on the timing then in force. This special effort was made some weeks after another run in which the timing of 6 hours 40 min. then current was improved on to the extent of 13 minutes, and on that occasion the engine was No. 46299 *Duchess of Hamilton*. The same driver, William



No. 46242 "City of Glasgow", with distinctive nameboard, makes an imposing sight at the head of "The Caledonian". This and the lower illustration on the next page are from B.R. London Midland Region photographs.

Starvis, of Camden, was in charge on both occasions, but with different firemen.

These trips made a better show than the 6 hour 30 min. or 61.8 m.p.h. schedule of the pre-war streamliner, although it should be said that the latter was a heavier 9-coach train of about 310 tons full. But neither that nor the present-day *Caledonian* managed to improve on the results recorded in the course of special test journeys from Euston to Glasgow and back made in 1936 with a view to the introduction subsequently of *The Coronation Scot*. The engine on this occasion was one of the first two Stanier 4-6-2 locomotives, *Princess Elizabeth*,

then L.M.S. No. 6201. Going north the run was made in 5 hr. 53½ min., with a 230-ton train of seven vehicles, and coming south in 5 hr. 44¼ min., this latter giving an average speed of 70 m.p.h. for the non-stop journey, even though the southbound load was greater by one vehicle, making the total tonnage 260.

For the summer season last year an additional *Caledonian* service each way was introduced, so that there were then morning and late afternoon departures from Euston and Glasgow Central as well. The timing was the same for all four trains, "400 miles in 400 minutes" being the theme although the distance is, as we have seen, just over 401 miles. But with the winter services starting in September 1958, the additional trains



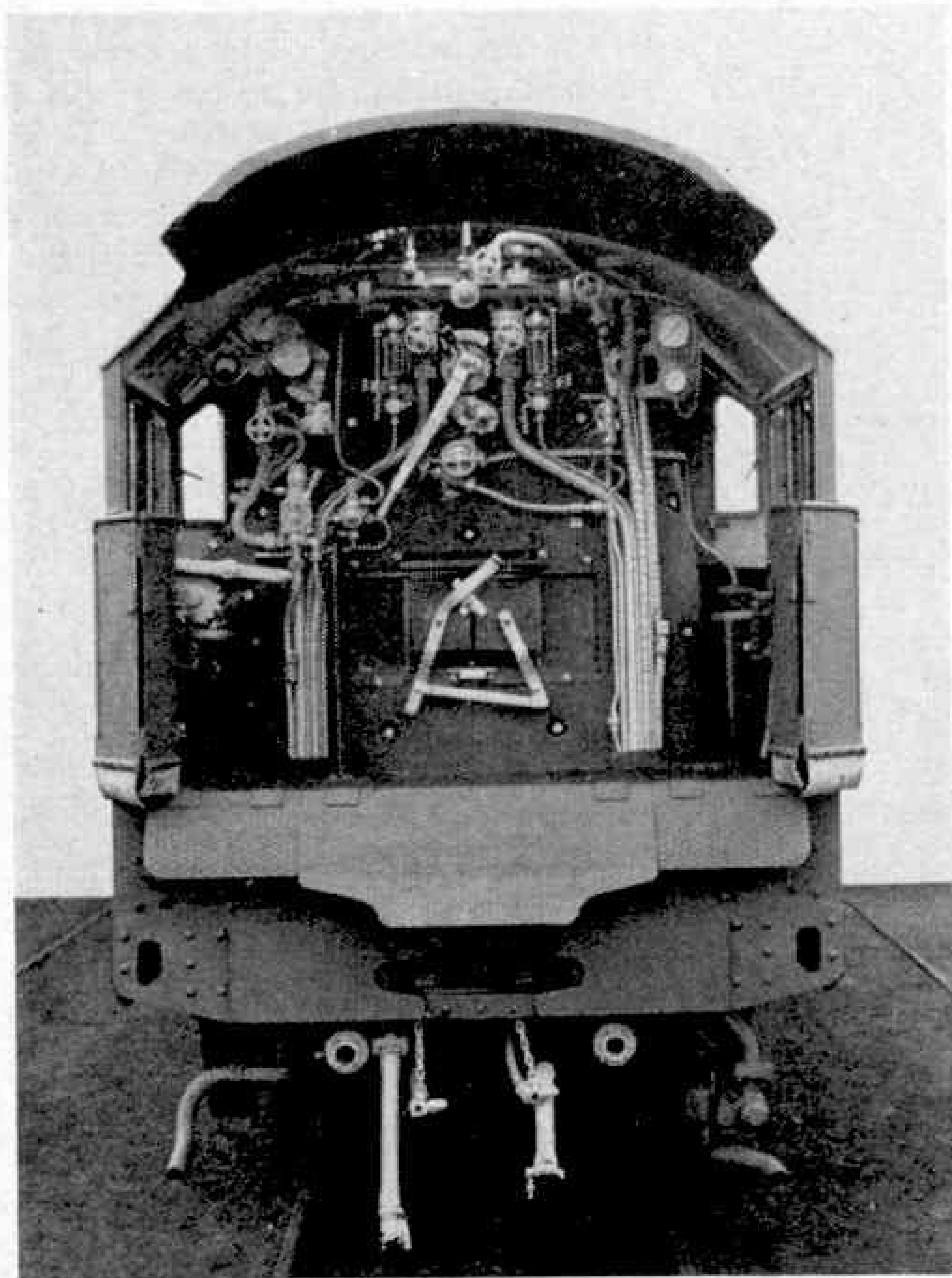
The up "Caledonian", on its way out of Glasgow, approaches Eglinton Street. Here again No. 46242 is heading the train. Photograph by G. H. Robin.

were withdrawn and the schedule eased.

The make-up of *The Caledonian* is restricted to 8 vehicles, with a gross weight of some 275 tons, accommodating 84 first-class and 120 second-class passengers. By current standards the B.R. stock employed is quite handsome and the train has the added distinction of special colouring for its name and destination boards carried above the windows of the coaches. It is fitting too that the engine of this rather special train should carry a distinctive headboard and you can see what it is like very clearly on the cover. Twin shields above the name panel bear respectively the crosses of St. Andrew and St. George.

First choice for running the trains are the Stanier 4-6-2s of the Coronation class, which of course have little difficulty in dealing with the standard 8-coach formation. One engine covers the whole journey, whether north or south bound, but the enginemen from Camden and Polmadie respectively change over at Carlisle. Some idea of just what they have to look after on the engine itself may be gathered from the illustration here. Apart from this, and their knowledge of the Rules affecting their job, the crew must know the road intimately, with its various permanent and the ever-changing temporary speed restrictions.

A recent aid to them in train running and safe operation on the route concerned has been the introduction, between Euston and Blisworth only for the time being, of the B.R. standard automatic train control system.



Footplate view of Coronation class 4-6-2 "Duchess of Norfolk", now No. 46226, as originally built.

A mechanical drill above the Ystrad limestone quarry described in this article bores holes over 80 ft. deep in which to pack explosives.

Men at Work The Limestone Quarry

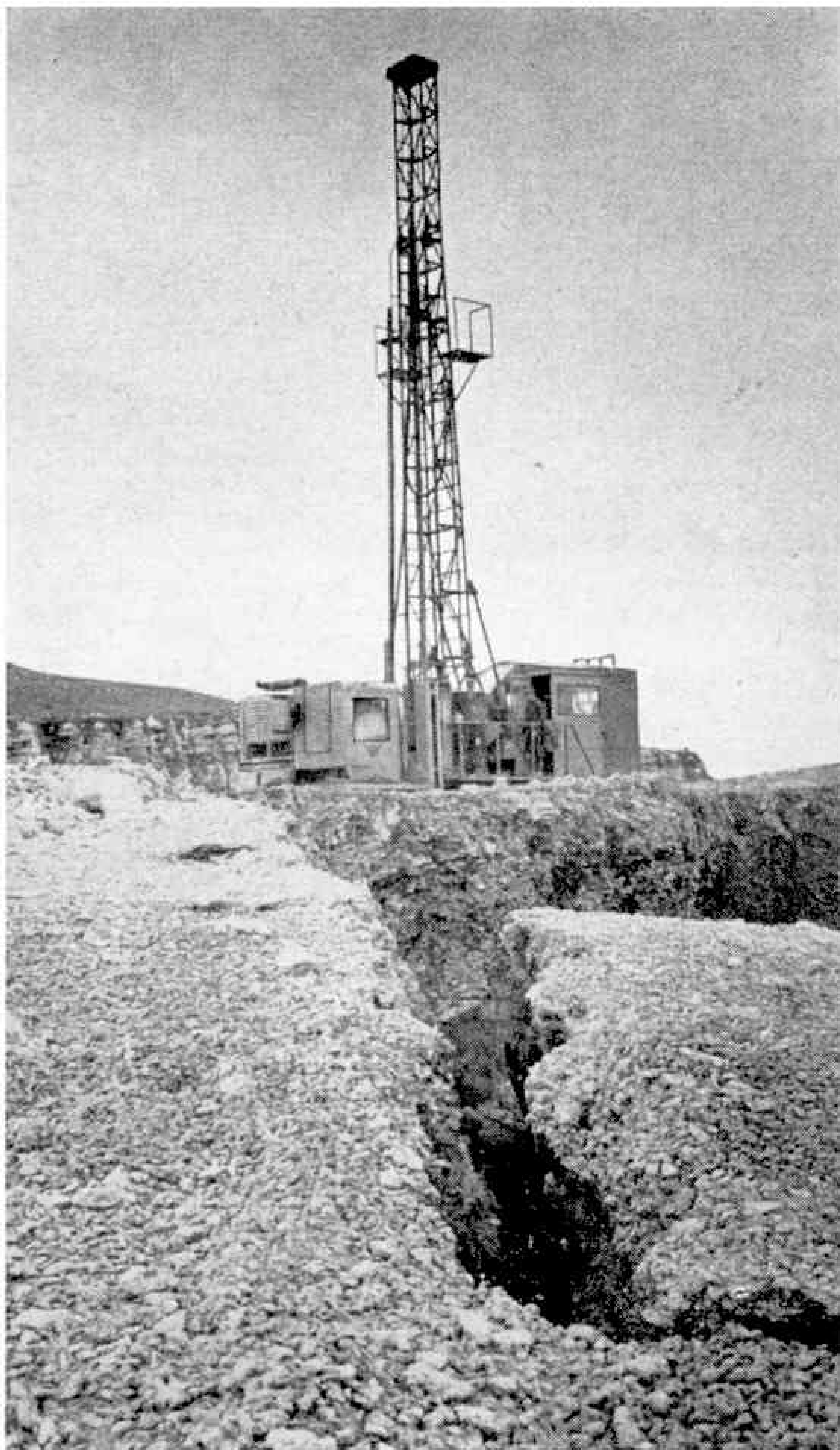
drilling machine, which bores holes for explosive charges. These are used to break up the 20-ft. layer of useless siliceous rock which tops the limestone stratum. This "muck" is dumped—as is all the non-saleable refuse from quarrying operations at Ystrad—in flat beds, conforming with the ground contours; it is eventually seeded to restore the natural beauty of this part of the Brecon Beacons National Park.

The big mechanical drill now

On the right fuses are being set for charges to break up large limestone boulders. Below the setter is running to cover after lighting the fuses.

THE giant furnaces, the roaring flames and white molten metal of a steelworks seem very remote from the cool, mountain serenity of Ystrad quarry, which is in the foothills of the Brecon Beacons. But there, ten miles from Ebbw Vale, a small band of men carry on the quiet, methodical stripping from the hillsides of one of steel's vital raw materials—limestone.

To feed the blast furnaces, the open hearth furnaces, and the lime burning plant, 7,000 to 8,000 tons a week of metallurgical stone is sent down the winding Company railway line leading to the iron and steel works of Richard Thomas and Baldwins Ltd., at Ebbw Vale. The process actually begins with a bulldozer, which strips off turf and top soil, and a small

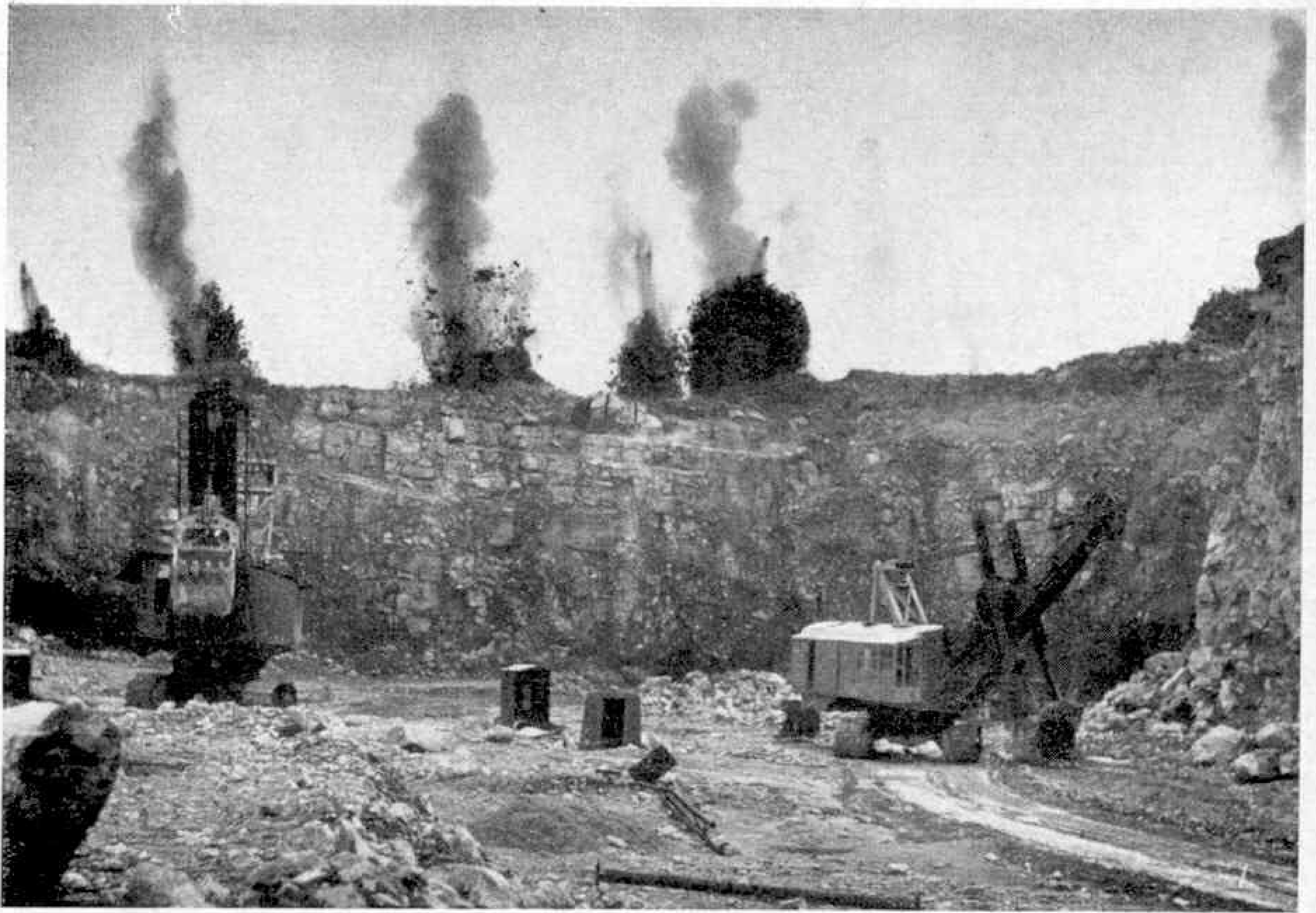


Lowering between 400 and 500 lb. of explosive into the holes bored by the drill on the left. All the charges are exploded at the same time—and down comes as much as 58,000 tons of limestone.

takes over and bores circular $6\frac{3}{4}$ in. holes to the depth of the face, some 70 to 80 feet. The holes follow a line roughly twenty to 24 feet from the existing quarry face, and are spaced at intervals of approximately twenty to 24 feet. All distances are carefully calculated to give the right blast for the volume of rock, a sufficient degree of fracturing, and an economical use of the explosive. Each hole—there may be fifteen or twenty, depending on the face length—is packed with between 400 and 500 pounds of explosive, either gelignite or *Thameite*, and the gap at the top of the hole is packed

with fine chippings and dust known as stemming. The shotsmen link up each charge by Cordtex instantaneous fuse to a time fuse.





All those who are not engaged on this operation are withdrawn meanwhile from the face—top and bottom—and steel bells are provided as shelters; the ensuing blast will bring down as much as 58,000 tons of limestone, which is carried away to the crushers at the rate of 12,000 tons a week.

Blasting takes place at intervals varying between three and five weeks, but the day-to-day work of removing the stone goes on steadily in between. Two giant excavators take four-to-five-ton bites from the pile at the quarry bottom, and load the waiting fleet of twelve-ton lorries.

The excavators are driven electrically, by power generated at the Ebbw Vale Works generating station. Like practically all the plant and equipment at Ystrad, they are owned by the Company and manned by Richard Thomas and Baldwins employees.

At the crushing and screening plant, a few hundred yards from the quarry, the lorries dump the stone—ranging in size from hefty boulders to chippings and dust—into the primary crusher. It goes along an armour-plated pan feeder over a seven-

roll Grizzly, which removes the clay and small stones; the "clean" stone is fed into a 60 x 48 in. breaker (or crusher), which reduces the stone to a maximum diameter of about ten inches. One conveyor takes away muck and small stones to a stockpile, another takes clean stone to a second pile.

From the "dirty" stockpile, a further conveyor takes the stone over a series of vibrating screens which reclaim as much as

possible; the stone from the "clean" pile is size-graded by a five-roll Grizzly, that which is too large being reduced in the 48 x 36 in. secondary crusher to eight

inches diameter.

Quarrying at Ystrad is highly mechanised and reasonably uneventful work; maintenance men who move in for weekly Sunday overhauls, labourers, draughtsmen, clerks and groundsmen who assist the excavator drivers—none would regard his job as dramatic. But there, in a little Shangri-la of sheep and ponies, green turf and white rocks, they make a most important contribution to the vast steel industry.

This article is reproduced by permission from "Ingot", the quarterly magazine of Richard Thomas and Baldwins Limited, to which we are also indebted for the pictures illustrating it.

The picture at the head of the page shows one of the mighty blasts that bring down many thousands of tons of limestone at a time. This is carried to the crushers at the rate of 12,000 tons a week, and five trains a day are needed to carry supplies to the iron and steel works.



The First Space-Man

By John W. R. Taylor

OVER in America, a pilot named Scott Crossfield is getting ready for the day when he will become the first man to travel in space. In a rocket-powered aeroplane known as the North American X-15, he will hurtle upward more than 100 miles, until he is above 99.9 per cent of the Earth's atmosphere. The remaining 0.1 per cent will hardly be distinguishable from the space which separates us from the Moon and planets of our solar system.

What sort of man is Scott Crossfield, and what will his hazardous flights achieve?

To find the answers to these questions, we must go back to the start of the X-15 programme in the spring of 1952. Five years earlier a U.S.A.F. pilot named 'Chuck' Yeager had passed through the sound barrier for the first time in a Bell X-1 rocket plane. Tremendous progress had been made in the intervening years, and N.A.S.A. (the National Aeronautics and Space Administration, then known as the National Advisory Committee for Aeronautics) decided it was time to start thinking about the kind of vehicle that would make possible flight beyond the atmosphere.

Many problems had to be considered. Ordinary control surfaces would be useless in space, where there is no air for them to

deflect, and an alternative had to be found. The vehicle had to be so designed and built that when it re-entered the atmosphere at high speed it would not be burned up, like a shooting star or *Sputnik*, by the intense heat resulting from friction of the air over its skin. The pilot had to be protected from extremes of temperature, and enabled to breathe at heights where there is virtually no oxygen and where his blood would boil if he were not encased in a pressure-suit.

These were but a few of the difficulties for which N.A.S.A. laboratories had to suggest answers. Yet within two years they had not only proved that the key to success was a manned aeroplane rather than a missile, but had worked out roughly the kind of

The picture above shows pilots assigned to the X-15 research flights. They are Joseph Walker, National Aeronautics and Space Administration; Capt. Robert White, U.S. Air Force; and Scott Crossfield, engineering test pilot for North American Aviation, Inc. These men are veteran experimental test pilots and also highly skilled aeronautical engineers.

aeroplane it should be.

In July 1954, N.A.S.A. representatives met technicians of the U.S.A.F. and U.S. Navy who had been studying the same problems, and it was agreed to continue the N.A.S.A. programme as a joint N.A.S.A./U.S.A.F./U.S.N. project. Five months later, companies with experience of producing high-performance aircraft were invited to submit design studies for an aeroplane conforming with the N.A.S.A. ideas, and in December 1955 the winners, North American Aviation, received the go-ahead to build three prototypes of

what is now known as the X-15.

From the start they realised that success depended on perfect co-ordination of man and machine, and asked the N.A.S.A. to release Scott Crossfield to help with the design work from the pilot's point of view and to make the first test flights in due course.

It was a wise choice. Crossfield had served as a fighter pilot and instructor in the U.S. Navy during World War II, before graduating as an engineer from the University of Washington. He had then spent a period as chief wind tunnel operator at the University's Aero Laboratory, and joined N.A.S.A. as a research engineer and test pilot in 1950. By the time he transferred to North American he had become the first man to fly at twice the speed of sound.

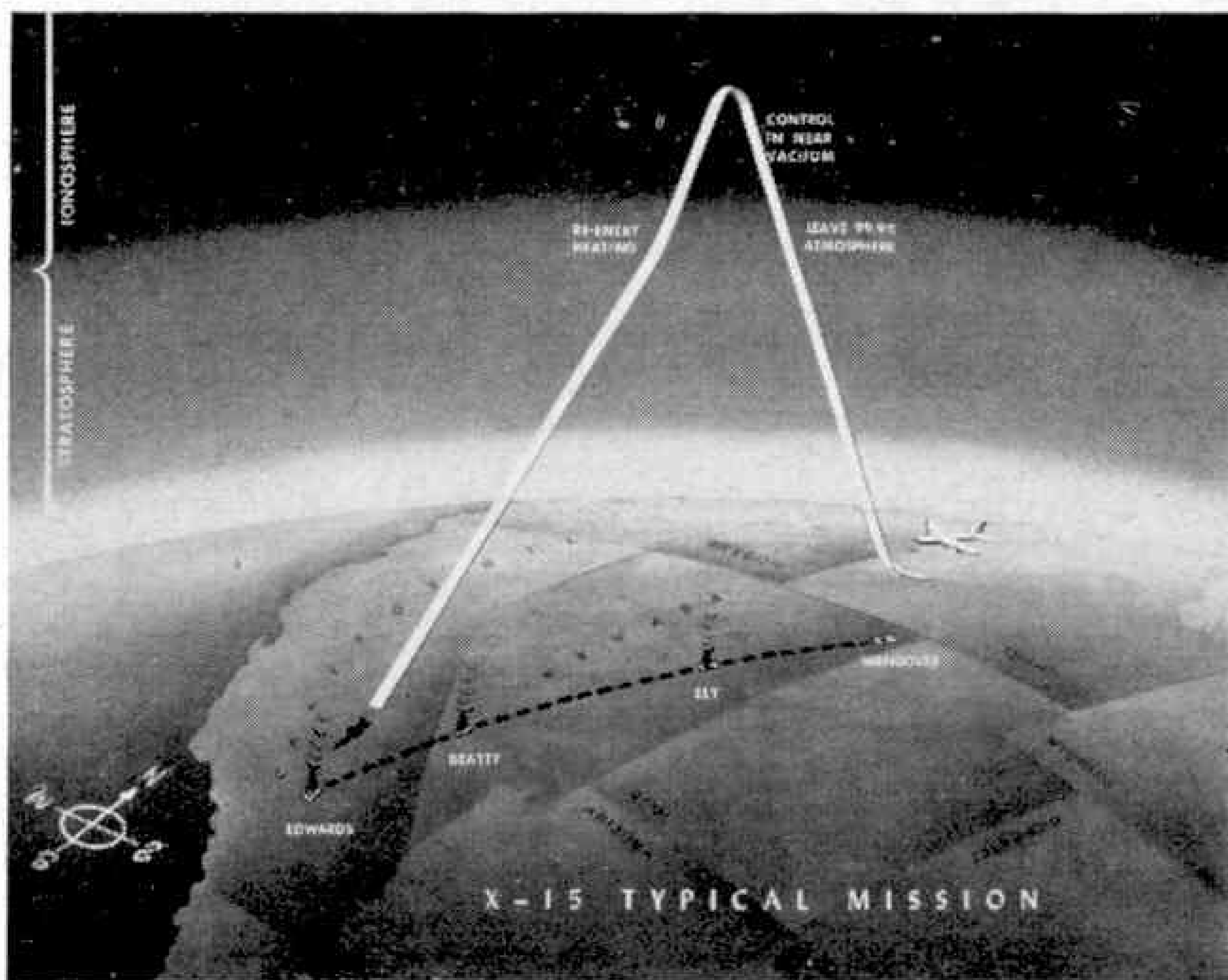
For the next 18 months Crossfield worked with North American technicians on the detailed design of the X-15. Immense difficulties had to be overcome, because the aim was to fly at least four times higher and nearly twice as fast as anybody had ever flown before—not just once, but over and over again, learning as much as possible from every flight.

The first requirement was for tremendous power. An engine giving 12,000 lb. of thrust had given the Bell X-1A a speed of 1,650 m.p.h. To make possible at least 3,600 m.p.h. with the X-15, the Reaction Motors company were asked to produce a rocket-motor that would give 50,000 lb. of thrust. This fixed the size of the aircraft, because the fuselage had to be big enough to house this engine and the huge tanks of liquid oxygen and ammonia propellants that it will swallow in a few minutes of full-power operation.

The X-15 ended up with a massive fuselage, 50 ft. long. In contrast, the fact that it was designed to be launched in mid-air from a B-52 Stratofortress bomber meant that its wings could be made very small. They do not have to develop sufficient lift to get the aircraft off the ground at slow speeds, and by the time it

lands, with its propellents used up, its weight will be comparatively small. As a result, the wings span only 22 ft., with an area of 200 sq. ft. This is little more than the wing area of an Auster lightplane, although the X-15's launching weight of 31,275 lb. is 13 times that of an Auster.

Even more surprising than the tiny wings is the wedge-shape of the upper and lower tail-fins, which are 12 in. wide at their trailing edges. This shape resulted from model tests in a high-speed wind tunnel, which showed that a wedge-tail would act most efficiently as a weathervane to straighten the aircraft if it began to 'snake'



This drawing illustrates the course of the X-15 when test-flown over the specially laid-out High Range extending 485 miles from Wendover A.F.B., Utah, to Edwards A.F.B., California.

in the thin air at high altitudes. The lower fin will be dropped off before touch-down, when the aircraft will land at about 207 m.p.h. on twin nose-wheels and a pair of retractable skids under the tailplane.

So much for the basic shape of the X-15. The next problem was to build it from materials and components that would withstand temperatures ranging from minus 300 deg. F. in space to 1,200 deg. F. during re-entry into the atmosphere. Eventually it was decided to cover the entire airframe with skin of a steel alloy named Inconel X, with a primary structure of titanium and stainless steel to meet any heat that gets past the outer shield.

Altogether, some 300 sub-contractors had been called in to add their skill and



North American Aviation's X-15, the aeroplane designed to carry a man as far as 100 miles above the Earth and to fly at 3,600 miles per hour.

experience to that of North American by the time construction of the X-15 began in September 1957.

Conventional wing and tail control surfaces will work only in the atmosphere; so Bell Aircraft were given a contract to perfect an additional 'ballistic' control system, in which rocket jets in the nose and wing-tips will push the aircraft gently in whatever direction the pilot chooses.

Sperry Gyroscope were made responsible for the electronic inertial guidance system which will work out the pilot's navigation and tell him how and when to re-enter the atmosphere in safety.

Garrett Corporation developed the liquid

nitrogen cooling and pressurisation system that will help to keep the pilot comfortable. The David Clark Company produced a special lightweight pressure-suit that will do the same job as the bulky corrugated space-suits so beloved of science-fiction writers.

While the aircraft gradually took shape in North American's Los Angeles factory, Scott Crossfield and the other North American, U.S.A.F. and N.A.S.A. pilots assigned to the project learned what it would be like to fly the X-15 at the U.S.A.F.'s Aeromedical Laboratory at Wright-Patterson A.F.B. (Air Force Base) and the Naval Air Development Center at Johnsville, Pennsylvania. Wearing David Clark pressure-suits, they subjected themselves to the heat of thermal chambers, low pressures of altitude test chambers, and high accelerations and decelerations in cabins at the end of 'whirling arm' centrifuges, one of which was fitted out as an exact replica of the X-15's cockpit.

In October 1958 the first X-15 was rolled out of the factory. On 10th March this year it was hooked in place under the starboard wing of its B-52 mother-plane, Scott Crossfield took his place in its tiny cockpit and became airborne in it for the first time.

Progress will be slow, because no unnecessary risks can be taken with the safety of men like Crossfield and aircraft which have already cost the U.S. taxpayer more than £40 million. First on the programme were unpowered tests in which the X-15, after release at 38,000 ft., glided steeply and quickly towards the miles-long runway at Edwards A.F.B., California, while (Continued on page 232)



Mr. Scott Crossfield, wearing the U.S. Air Force's new lightweight pressure space-suit. Official U.S. Air Force photograph.

Road and Track

By Peter Lewis

THE month of May brings us two outstanding motor-racing events, the International Trophy at Silverstone and the Grand Prix of Monaco. The latter is the first event in the 1959 World Championship for drivers and should see a tremendous tussle between Stirling Moss on the Cooper-B.R.M. and Tony Brooks on a Ferrari.

It was only recently that Brooks joined the Italian team, having driven a foreign car on only one occasion during seven seasons of motor-racing, and in my opinion he has a very good chance of becoming

enable him to challenge Brooks on equal terms. But there is no agreement at the time of writing about the use of the B.R.M. engine in Rob Walker's Cooper chassis after Monaco. What will Moss drive in championship races for the rest of the season? An answer will have to be found before the Dutch G.P. on 31st May, and the performance of the various British *marques* at Monaco should provide that answer. Personally, I hope the Cooper-B.R.M. is successful, and that Moss will be allowed to use the engine for the remainder of the season.

The Berkeley

What a truly remarkable little car is the new Berkeley B.95, the first model of this *marque* to go into production as a 100 m.p.h. car. The secret is in the Royal Enfield 692 c.c. air-cooled, vertical, twin-cylinder o.h.v. engine that is now being installed in certain Berkeley models.

Previously two different types of two stroke engine have been fitted at the Biggleswade

factory, the smaller being of 328 c.c. and producing about 20 b.h.p. while the larger was of 492 c.c. and produced 30 b.h.p. The new four stroke engine gives 40 b.h.p. at 5,500 r.p.m., while a high performance version, producing 50 b.h.p. at 6,250 r.p.m., is available in limited quantities.

Apart from catering for the needs of the enthusiast—and Berkeleys are often seen in sports car racing and rallies—the installation of the 692 c.c. engine will appeal to the average owner-driver who likes a lot of power to spare. It is docile in traffic and yet has a very good reserve of power indeed.

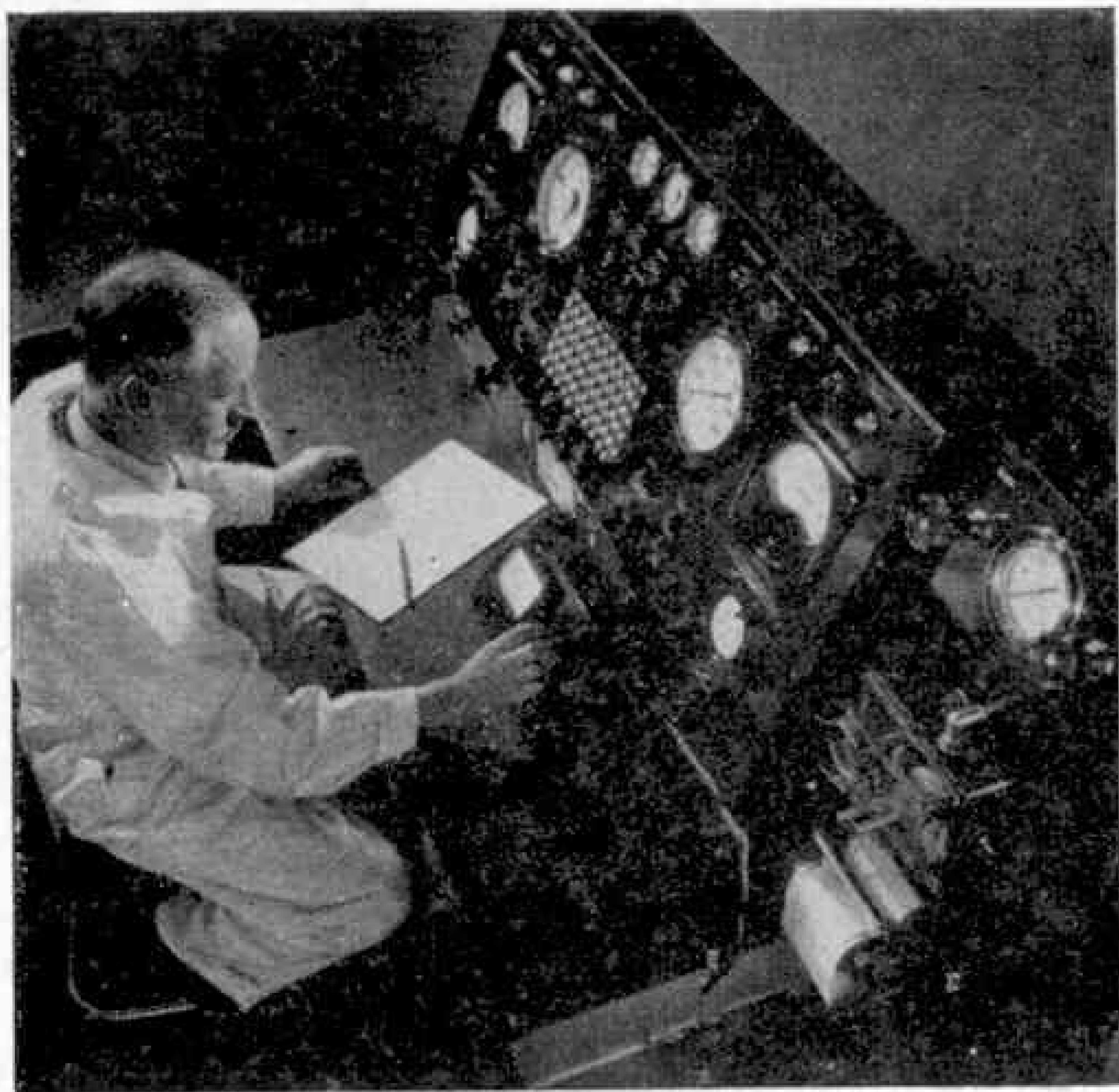
The Berkeley has never been a sluggish car, for the firm pioneered fibreglass bodies



Stirling Moss, G. A. Vandervell and Tony Brooks after the Ferodo Trophy had been presented to Mr. Vandervell for the most outstanding British contribution to the sport of motor-racing in 1958.

Champion of the World this year. His victories for Vanwall last season—when he was No. 2 to Stirling Moss—underlined his superb driving skill on every type of circuit, and in the Ferrari team there will be no question of Brooks having to take second place to his team-mates Phil Hill and Jean Behra. The combination of Brooks and the 1959 Ferrari—a car that is now as near perfect as possible—will be very hard to beat.

There is one driver in particular who can prevent Brooks from getting the championship, but he can only do so if the car he drives is equal to the task. I refer to Stirling Moss; and the Cooper-B.R.M. which he drives at Monaco may well



The control panel of a brake lining test machine in the new Ferodo Research Laboratories. Brake pressure, brake reaction torque pressure and lining temperature are recorded and a special counter gives stopping times to the nearest hundredth of a second.

and subsequently produced a very light, but extremely strong body structure. Engine and front wheel drive transmission units apart, the Berkeley weighs only 700 lb. Therefore a relatively small engine will produce a good performance and the space occupied by the engine can be restricted, with a consequent reduction in the height and frontal area of the car. The result is less wind resistance and better performance.

The above features in turn affect roadholding and the performance of the brakes. Although there is adequate ground clearance the weight of the car is close to the ground and the brakes have comparatively little work to do because of the light weight. In other words there is a high power to weight ratio and a very low centre of gravity, and the brake lining area per ton is of a very high order.

Independent suspension is employed on all four wheels and the combination of this and the good qualities outlined above produces excellent

roadholding and good braking performance. As the manufacturers say "The Berkeley has grown up and is really going places fast—and safe."

One can imagine that with a combination of such a light body structure and the new, more powerful engine the Berkeley should prove a very potent little competition car.

The Science of Braking

At every important race meeting in this country and on the Continent, the Ferodo Mobile Workshop is a conspicuous landmark in the paddock area. The man who gives on-the-spot service and advice to competitors, during practice sessions and on race day is jovial Syd Henson, acknowledged on every circuit in Europe not only as an expert on all matters pertaining to braking, but also as the man who can produce a good cup of tea, British fashion, quicker than anyone else—and sometimes at the rate of hundreds of cups a day.

Henson is part of a large organisation that has been closely associated with racing, rallies and trials since the very early days of motor sport. Ferodo are far-sighted enough to acknowledge that competitive events stress vehicle components far beyond the limits imposed by normal driving and provide a first-class proving ground for manufacturers' products. To Ferodo motor-racing is a direct extension of the testing programmes carried out at their Chapel-en-le-Frith works. *How Ferodo brake linings are tested is explained on page 268.*



The new Berkeley B.95 has lapped the Lindley test track at average speeds approaching 100 m.p.h.

How a Queen Travelled

A Luxury Saloon of Victorian Days

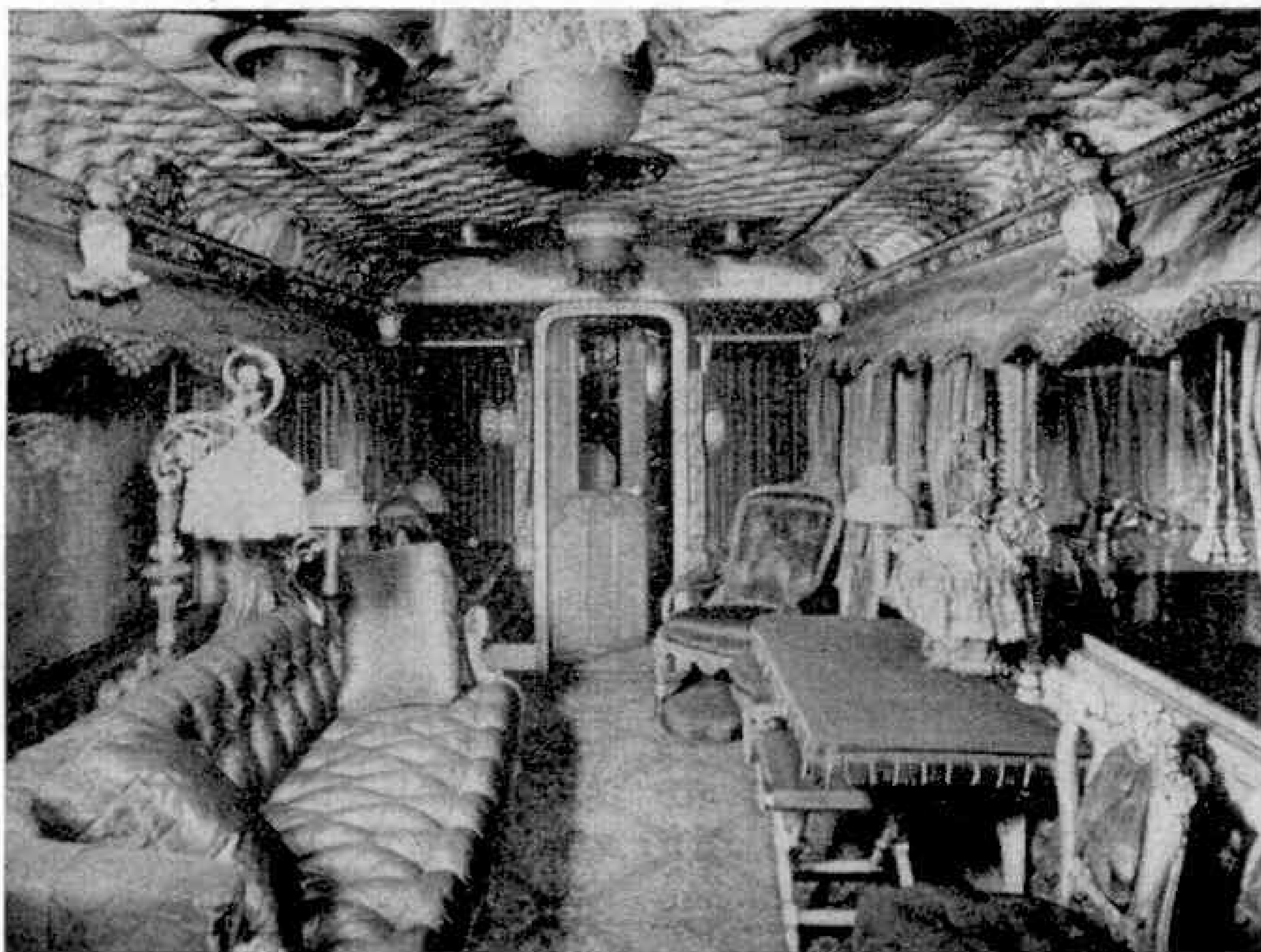
JUST take a look at the picture on this page. What a magnificent saloon it shows. To us it is ornate and over-decorated, and not at all in line with styles of today in either furnishings, lamps, curtaining or almost anything else. But those who travelled in a carriage of this kind, for it is indeed a railway coach, certainly enjoyed luxurious comfort.

In the closing years of last century the private cars, to use the American term, of millionaires in the United States were among the most magnificent vehicles ever built. They were in fact fabulous homes, fully furnished in accordance with the tastes—and pockets!—of their millionaire owners. The carriage illustrated on this page was not one of these, but it could certainly be ranked with them as a wonderful example of a previous age in railway travel; and it far surpassed any of them in a railway sense, for it was the chief ornament of a whole train, the running of which was carried out with the most meticulous care for the comfort and safety of its occupants, under the direction of the highest of railway officials. This is indeed a Royal Carriage that was used by Queen Victoria. Since her last journey in it in November 1900, when she travelled from Ballater to Windsor, it has remained in store except when required for special displays. One such occasion was the 1959 Furniture Show at Earl's Court, which opened on Wednesday, 28th January of this year.

The Royal Saloon, as it was called, provided separate day and night compartments, and the picture on this page shows the interior of the former. The sofa and easy chairs, the footstools and the table

are those in use when Queen Victoria travelled in the saloon, as are the heavy quilting in white and blue watered silk on the ceilings. The original lighting was by oil and candle lamps. Two efforts had been made to bring it up-to-date, once by installing gaslight and later by fitting electric lights, but each time Her Majesty found the change unsatisfactory and a return was made to the old oil and candle lamps.

The saloon started its career as two connected six-wheeled carriages built in 1869 by the London and North Western Railway, and Her Majesty first travelled north to Ballater in it in May 1869. It received its present form as late as 1895, when the two bodies were united on a single frame to give the present twelve-wheeled carriage. It has a floor of double boarding,



The day compartment of the Royal Saloon in which Queen Victoria travelled between Euston and Ballater, the nearest station to Balmoral Castle.

the intervening space being filled with granulated cork to lessen vibration and deaden noise. Its outside is as elaborate and ornate in colour and decoration as the interior. The cornice moulding is carved with an acorn and oak leaf design and the ends of the buffer beams are fashioned in



Queen Victoria's Royal Saloon on the way by road to an Exhibition at Earl's Court.

the shape of lions' heads and covered with gold leaf. Door handles are gold plated. The carriage is painted in the purple brown and off-white livery of the L.N.W.R., and the lower panels are decorated with the Royal Arms and the insignia of the Bath, the Thistle, the Garter and St. Patrick.

Since its last journey the carriage has been carefully preserved in the form it then had. It represents what must be described as the last word in luxury travel in Victorian days, and it exhibits in its construction and its interior fittings and ornamentation many examples of British craftsmanship of last century at its best.

The first part of the journey of this magnificent saloon from its temporary store at the British Railways works at Wolverton, Bucks., was made by rail, and brought it to the Brompton and Fulham railway sidings. There it was lifted off its rail wheels and transferred to special bogies fitted with road wheels.

The greatest care had to be taken during this operation to avoid damaging this unique example of Victorian splendour, which has a historical value that has been estimated at £45,000. For this purpose therefore a special combined operation was planned by British Railways and B.R.S. (Pickfords) Ltd., who were responsible for the rest of the journey to Earl's Court. In this the coach body and frame, 64 ft. long and weighing 25 tons, was lifted evenly by mechanical jacks from its rail bogies and then lowered into position on the special road bogies. It was then hauled by tractor to Earl's Court, and the picture on this page shows it on one stage of this novel journey, throughout which it attracted close attention.

On reaching the Exhibition site the carriage was lifted back on to its rail bogies, each of which weighs 5 tons. These had been conveyed separately from Brompton and Fulham sidings on a low-loader trailer.

"HISTORICAL STEAM LOCOMOTIVES"

By O. S. Nock, B.Sc.

(Black, price 21/-)

The author has been a prolific writer of books on locomotives and railways and in this, his most recent work, he maintains his easily readable style of presenting a story. His topic, historical steam locomotives, is a wide one. The book deals more particularly with British Locomotives of types that are preserved in museums and elsewhere; and it is fortunate, in view of the onset of diesel and electric main line traction, that there is a comforting number of these veteran specimens. No doubt others still in service will be added.

The story ranges from *Locomotion* of 1825 to *Lode Star* of 1907, with interesting accounts of the reasons behind the varied designs and with details of their

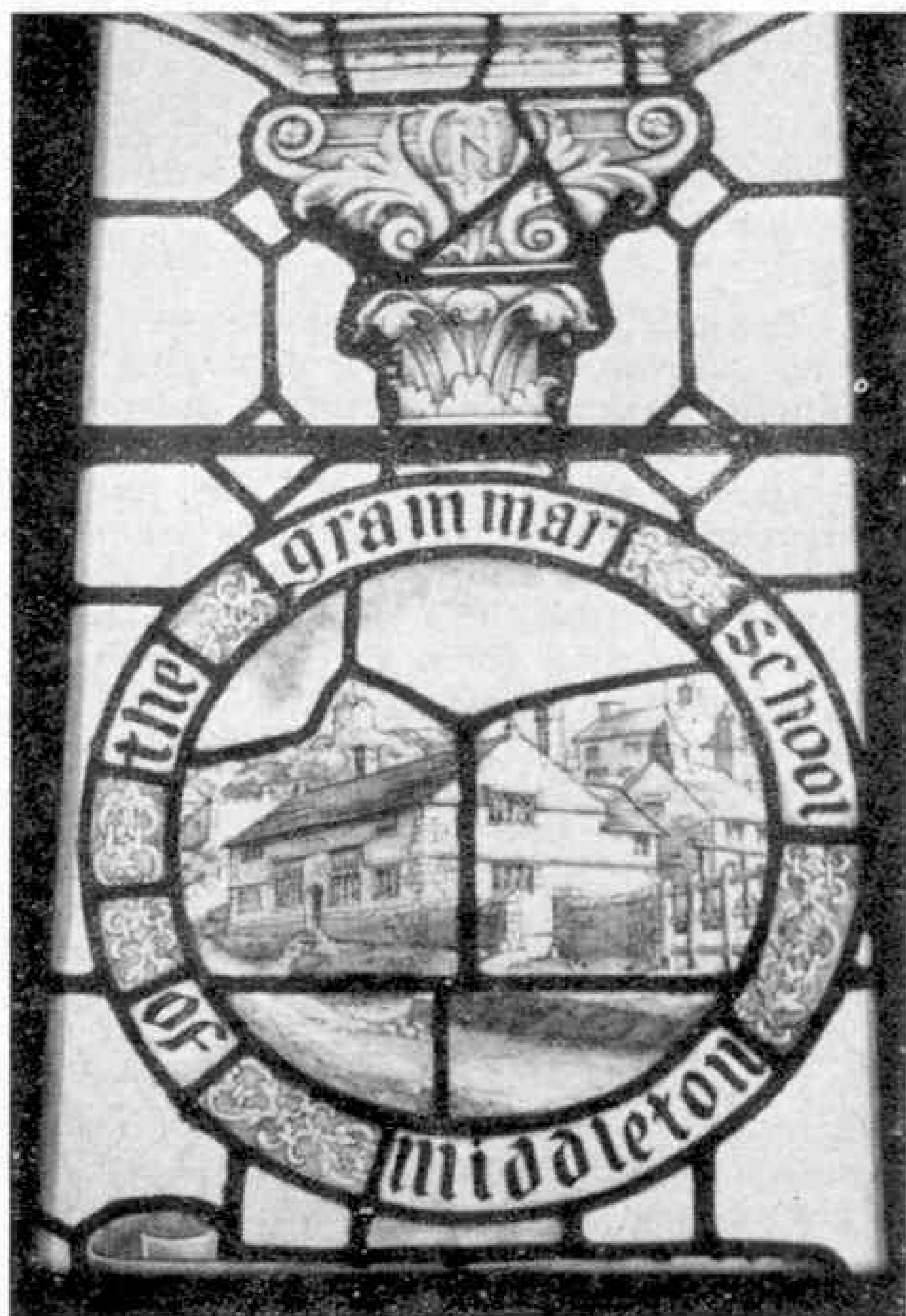
performance in service. In general the chapters tell the tale of steam from 0-4-0 to 4-6-0, taking in single-drivers, long-boilers, Atlantics and so on, a glorious array, all of them in the splendid and diverse styles of the golden age of railways.

A competent and enthusiastic note is struck throughout, with many appropriate illustrations. Naturally engines involved in the now almost legendary "Races to the North," in 1888 and 1895 respectively, receive their due share of attention, as do the two Great North Atlantics that emerge on occasions from York Railway Museum to haul special trains. In addition of course there are the revived No. 123 Caledonian 4-2-2 and G.W.R. *City of Truro*, the latter in service again after spending many years as a museum piece, with the reputation of being the first steam locomotive to have reached a speed of at least 100 m.p.h.

Stories in Stained Glass

By Arthur Gaunt

PICTURE galleries of great interest in the form of stained glass windows are to be found throughout the length and breadth of Britain. These entertaining displays of art are not confined to our great cathedrals, for examples with fascinating stories enrich village churches



An accurate reproduction of the old grammar school at Middleton, near Manchester, is to be seen in one of the parish church windows.

too, and they include efforts by both modern and medieval glaziers.

The subjects of these pictures in glass are by no means all religious ones. Some of the things portrayed are suprising. You would scarcely expect to find a railway locomotive depicted in a church window, nor would you normally look in such a place for a picture of a life-boat or an old grammar school. But they are to be found in sacred buildings.

A representation of a life-boat on a rescue operation is incorporated in a memorial window in Weston Church, an isolated edifice near Otley, Wharfedale. It shows a life-boat crew rowing to the aid of a disabled sailing ship that has been driven ashore and is in danger of breaking up.

The window is in memory of Mrs. Emma Dawson, of Weston Hall, and commemorates her keen interest in the work of life-boatmen. She gave a life-boat for service at Redcar, on the North Yorkshire coast, and the craft depicted in Weston Church is thought to be that particular vessel.

Even more absorbing are the pictures in a window of Daresbury Church, Cheshire. Here are to be seen a number of familiar characters from *Alice in Wonderland* and *Through the Looking Glass*. There are the Dormouse, the Mad Hatter, the Cheshire Cat, the Queen of Hearts, the March Hare, and of course Alice. The fact that Lewis Carroll was born nearby is the reason for this unusual window, which also shows the shields of Rugby School and Christ Church College, Oxford, where he was educated. Lewis Carroll himself is portrayed too.

Middleton Church, near Manchester, is another edifice with an engaging stained glass window. In fact, here are both ancient and modern examples well worth seeing.

From this parish a number of archers set out for Flodden in 1513, and the occasion was marked by putting a pictorial window into the church. It shows bowmen kneeling in prayer before going forth to war. Each has a longbow slung over his shoulder and carries a sheaf of arrows on his back.

A modern window contains a picture of the old local grammar school, a two-storey building which still exists. A curious incident concerning this school relates to a legacy of £500 left to the governors 300 years ago. The donor was John Bradshaw, and the school never got his gift, for his estates were forfeited at the Restoration for the part he played in condemning Charles I to death. The school window in the church shows a faithful, detailed representation of the old school in full colour.



The Unknown Warrior appears in a memorial window at Harrogate.

Considering that nearly every church in Britain contains some stained or painted windows, either ancient or modern, it is hardly surprising that other unusual examples are to be found. The railway locomotive window already mentioned is in the St. John's Church, Paddington, London. It was introduced because the vicar is the honorary chaplain of Paddington Station. It shows the *Cornish Riviera Express* drawing out of that London terminus at the start of its long run to the south-west.

When a war memorial window was required for St. Peter's Church, Harrogate, the choice of subject was unusual but apt. The window takes the form of a reproduction of a *Punch* picture showing a British "Tommy" being challenged by an angel. Below the picture the following lines appear:

Who goes there?
I have no name. I died for my country.
Pass, unknown warrior.

Heroism in peace time is commemorated by a unique window in Alfreton Church, Derbyshire. It is a reminder of the bravery of a schoolboy who lost his life in attempting to save a small child from drowning. His window shows an angel lifting him from the water while another angel holds up the little girl he vainly tried to save.

An engaging legend is portrayed in glass panels in another Derbyshire

church, the one at Morley. This painted glass, 500 years old, depicts the story of St. Robert of Knaresborough, who was charged by the king's gamekeepers with illegally shooting one of the royal deer. Saint Robert is shown pleading his case before the king, who offers him all the land he can plough round with the deer in one day, and a further panel depicts the saint doing this. These ancient windows were originally in Dale Abbey.

Dogs also have their portraits in stained glass, and an example is to be seen in a memorial window in the parish church at Ashton-under-Lyne, Lancashire. It shows the four-footed pet of a former town clerk. Another dog appears with its master in a window of Lenton Priory Church, Nottingham.

A pedlar with his dog is the subject of a remarkable window in Lambeth Parish Church. The pedlar is dressed in breeches, coat, hose, and cap, with a long stout staff in his hand and a pack on his back, while his faithful dog walks alongside.

The present window replaces a similar one that was destroyed during the War, but the story goes back at least 450 years. The picture is supposed to represent an itinerant trader who became prosperous and bequeathed some nearby land to the church. The exact circumstances are



The pedlar and his dog in a window of Lambeth Parish Church. Land which he gave to the church has increased enormously in value.

obscure, but one account says that the legacy was dependent upon the installation of a stained glass window in memory of the pedlar and his dog. Another account is that the window was paid for by him in return for a promise that he could bury his pet in the churchyard.

Whatever the truth about that, a plot of land known as the Pedlar's Acre was long ago given to Lambeth Church. In 1504 it brought in an annual rent of 2s. 8d., but by the end of the 19th century the amount had increased to £1,800 a year. When the plot was eventually sold to the L.C.C. in 1910 it realised more than £80,000!

Fairford, Gloucestershire, has a rich array of old stained glass with a different kind of story. Tradition says that a merchant adventurer brought a whole shipload of lovely Flemish glass to England; and sought a church suitable for it. His quest for a fitting setting failed, so he built Fairford Church especially to house it. That is why this edifice has such a wealth of coloured windows—twenty-eight of them, all filled with fine Flemish glass.



This window showing an angel rescuing a child from drowning is in the parish church at Alfreton, Derbyshire.

Even modern stained glass windows sometimes have singularities, and one at Rye is unique because it may be regarded as a memorial to a bird. For 200 years the avocet, a black and white wading-bird with a curved beak, was absent from Britain. Then, a few years ago, it unexpectedly returned to the Sussex marshes. It is now shown in a memorial window in Rye Parish Church.

A curious story surrounds one of the windows in Blidworth Church, Nottinghamshire. It is filled with French glass, and an identical window was once supplied to Cologne Cathedral by a strange mischance. The Blidworth window was ordered from a Metz firm, and was made by French glaziers during the siege of Metz in the Franco-German war.

It was duly delivered after the war.

But there was astonishment in the village when a second, identical one arrived. It transpired that the enquiry about delivery had been wrongly regarded as an order for a second window! Blidworth could not afford two, so the duplicate was returned, and ultimately installed in Cologne Cathedral.

The First Space-Man—(Continued from page 225)

its pilot tested the effectiveness of the controls. Engine tests, with the aircraft anchored firmly in place under the B-52's wing, came next; and the first real powered flights should have started by the time this issue of M.M. appears.

At the moment, the X-15 has two 12,000 lb. thrust XLR-11 rocket-engines of the type fitted in the X-1A, but soon its proper 50,000 lb. thrust XLR-99 rocket will be installed and Scott Crossfield will be able to complete the initial flight tests at very great speeds and heights. His place in the cockpit will then be taken by Capt. Robert White, of the U.S.A.F., whose job will be to find out just how fast and high the aircraft will go, before handing it over to Joseph Walker of the N.A.S.A. for continued research.

All flights will be made over a specially laid-out High Range extending 485 miles from Wendover A.F.B., Utah, to Edwards A.F.B., and equipment has been installed atop a 9,000 ft. mountain at Ely, Nevada, to measure the X-15's performance as it streaks over this course.

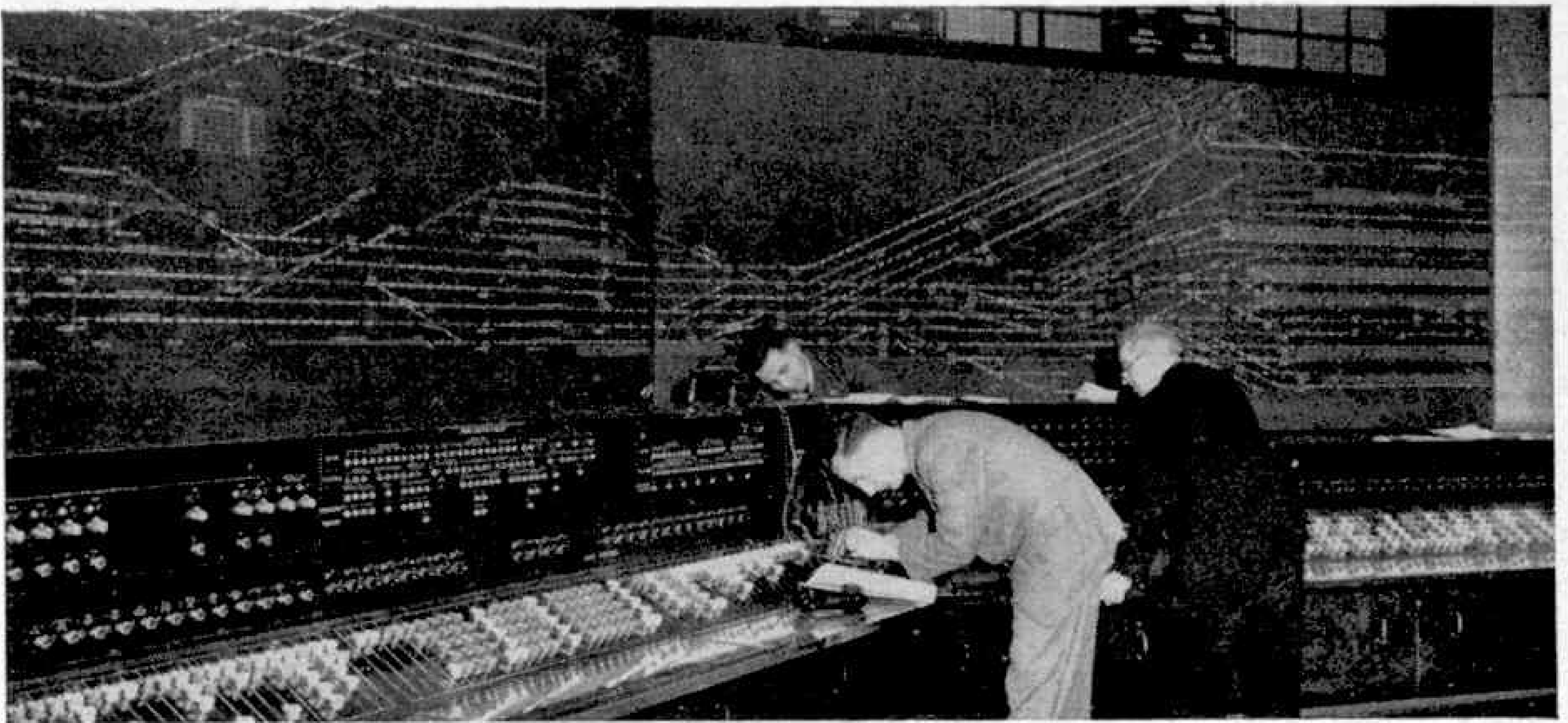
Whatever records it achieves in its present form may

be only a start, for there is a plan to shoot one of the later X-15s into a satellite orbit at 18,000 m.p.h., with the help of a giant boost r rocket. So there seems little doubt that this exciting aeroplane and the courageous men who have waited four years to fly it will soon be counted among the great pioneers of aviation.

TRACTION ENGINE RALLY

The Andover and District Model Engineering Society are holding their annual Traction Engine Rally at Finkley Manor Farm, Andover, Hants., on Saturday, 9th May, and will open at 12 noon. There will be the usual fascinating gathering of steam traction engines and, as last year, also of veteran cars. The big Model Engineering tent will house a splendid array of models. A thrilling event will be a grand display by a horse-drawn steam fire engine.

Mr. G. Howell, of 5 The Crescent, Andover, is again the Rally Secretary, and he will be pleased to give further particulars to readers who hope to be able to visit the Rally, and who will write to him for them.



Modern Railway Signalling

By R. A. H. Weight

IN the early days of railways, well over 100 years ago, signalling was very primitive and was largely confined to junctions and principal stations or termini. Indications were given by disc or semaphore signals, at first manipulated by hand and later by means of wires or rods over very limited distances from, say, a lineside or platform building. Trains, which were usually infrequent, were dispatched on a time interval basis, to a certain extent "on chance." The invention of the electric telegraph permitted a few messages to be transmitted in code, so leading in time to the introduction of single-needle telegraph instruments along whole lengths of railway, and to the use in signal cabins, or boxes as they became known, of other instruments capable of conveying information about trains by visual and audible means.

From all this, in Victorian days, sprang the fundamental basis of safe working and strict regulation of traffic known as the block system. All lines used for passenger or fast trains were split up into block sections, each controlled by a signal box having stop and distant or cautionary signals for each direction. These, together with block telegraph instruments properly

handled, ensured that not more than one train could be in the section under the control of any signal box at one time, and another could not be admitted until a message indicating *line clear* had been received from the cabin ahead.

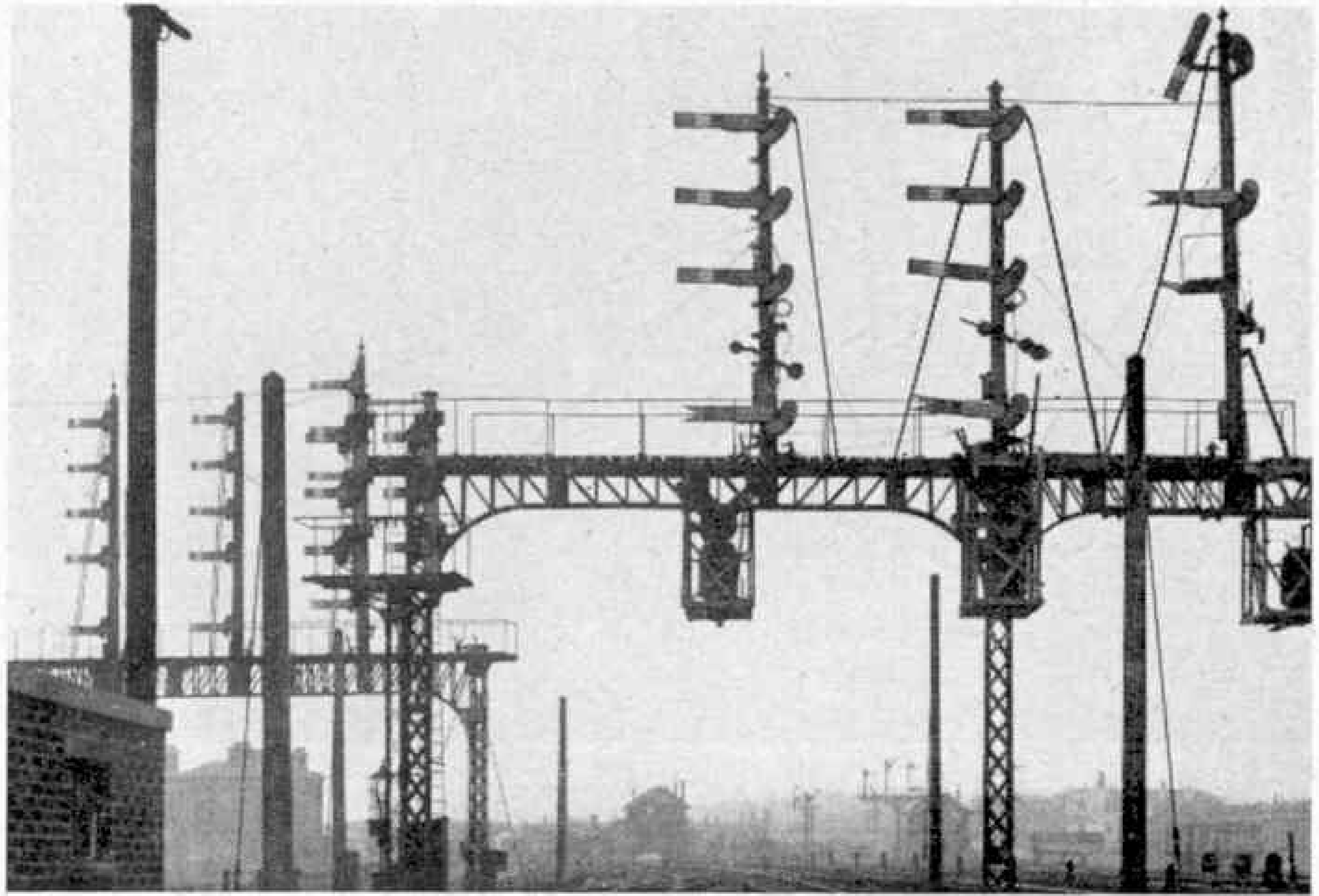
This general principle still applies. Thousands of miles of British tracks, some very busy, are today adequately protected by individual signal boxes and semaphore signals worked by levers in conjunction with block instruments. Many also enjoy varying degrees of modernisation and electrical or pneumatic aid, while telephonic communication has been considerably extended and improved.

The operation of points and crossings to enable trains to pass from one line to another is an important part of signal box routine. It has long been the practice to interlock mechanically the various levers controlling points, running and shunting signals, so that conflicting movements cannot be signalled; and interlocking ensures that levers can only be pulled in correct sequence.

But many changes and entirely new developments have come about in the signalling world in recent times and progress is rapid! The application of more advanced electrical operation, selection,

The picture at the head of the page shows the interior of a modern signal box. At the time when the photograph was taken circuits were being tested before a new power signalling and points installation was brought into service. B.R. North Eastern Regional Official photograph.

When photographed the old type semaphore signals seen here, which are of the G.N.R. somersault type, were shortly to be replaced by the colour light signals shown below them on the same gantry. B.R. Eastern Region Official photograph.



coupling-up, etc., has revolutionised much of our signalling. There is no longer need for a manned signal box to work every group of junction points, nor for each block section. Signals and points can be actuated from cabins considerable distances away, with power assistance on the ground, and there are intermediate stop and distant signals with electrical control.

So far we have dealt with what may now be regarded as the older, semaphore signals, the arms of which are either lowered from the horizontal position, as in W.R. practice, or raised to indicate *line clear*, the latter being what are called upper-quadrant signals. By night their attached lamps, in conjunction with coloured spectacle glasses, show red, yellow, or green lights to give corresponding indications, the lamps nearly always burning oil. At more or less complicated junctions it has been usual to have gantries spanning the lines carrying groups of signals on separate posts applying to each possible route.

These, like single or bracket signals at varying heights, are sometimes rather difficult to pick out at speed, especially in unfavourable weather conditions. The modern electric colour light signals, at eye level, are brighter and are visible by night and day. In their simplest form they look much like road traffic lights, and have the advantage that they display the same aspects, red,

yellow, sometimes double-yellow, or green, at all hours of the day or night. They can be controlled from signal boxes, as many of them are, and they can be operated automatically by means of electric contacts. In fact entirely automatic working is possible over considerable distances, as is now done on many London Transport and certain Southern electrified routes, and other lines.

Safety precautions of course are necessary. An essential feature of these is the track circuit, in which a weak electric current passes along the rail from a source at one end to a relay at the other. The relay is "shunted" if a train or vehicle is in the section, that is to say it electrically

locks the signals controlling entry into that section until all the wheels have moved clear or travelled forward an agreed distance. The wiring can be seen at rail joints carrying the circuit from one rail to the next. By means of insulated fishplates at certain such rail junctions, one circuit ends and another begins.

A splendid example of a typical old-time lower quadrant semaphore signal of former North Eastern origin, with characteristic slotted post crowned by an ornamental finial. Photograph by B. C. Bending.



Many large and modern signal boxes, or control cabins as they are becoming, have illuminated diagrams on which the track circuits are shown by numbers within the area controlled. As trains run over them, lights appear to inform the signalman exactly where the train is. Plans of all the tracks, with the numbers of the applicable levers, points and switches displayed, are also usual, but vary in style according to the type of cabin and equipment.

Let us see what the modern four-aspect colour light signal tells the driver of a train. If he sees the double yellow, that is two yellow lights one above the other, he is being given a first warning, and may pass at speed. But he must be prepared to find the next signal indicating single-yellow. This is the normal *Caution* aspect, and he must bring his train under control so that he can stop at the next signal if it is red, for then the road ahead is not clear. When a green light shows he can of course proceed.

Many of these lights are of the searchlight type with independent double filament lamps and show up well in fog. One filament is a stand-by, coming into use automatically if the main one fails.

At junctions instead of having several sets of posts or groups of semaphore signals, the direction when points are set for a diverging route is often indicated by a row of white lights set at an angle, pointing left or right as required. These light up when the appropriate green or yellow shows on the signal lamp concerned. Another method, used a good deal around station areas where speeds are not normally high, is the display of numbers or letters by means of lamps in a frame close to the signal lights, indicating the platform into which a train is routed or the line—main, local and so forth—along which it is proceeding. There are also various forms of lesser or subsidiary signals, some of them lighting

up only when necessary, that govern access to and from sidings or control shunting within station or yard limits and so on.

Revolutionary changes too have taken place in the method of operating signals and points. In many instances signalmen sit at consoles, or stand by panels, where they press buttons or turn thumb switches instead of manipulating heavy levers. They work perhaps almost in silence and surrounded by diagrams, on which coloured and lighted indicators show

clearly the positions of trains, prove that points are set and that signal aspects are correct for the traffic movements in hand. One simple handling of the appropriate small switches can set up a whole route, crossing perhaps several tracks, and release the necessary signals.

Interlocking is so complete that no fresh movement can be made until the line concerned is clear, although in order to save time the preliminary setting of a route for the next train or engine movement, say, can be made while there is a train in the section. As soon as the latter has cleared, the next movement of points and signals, that has been "stored" so to speak,

automatically takes effect in a matter of seconds only.

This kind of operation emphasises remarkable progress made as regards ease and speed of traffic control, which is invaluable at important junctions and termini. More of these wonder cabins are under construction and being planned. They are able to take over the work of anything up to five or more of the old-style separate signal boxes. Indeed at York one cabin concentrates under power control the functions of eight former signal boxes that were worked mechanically and provides for 828 routes covering $33\frac{1}{4}$ track miles, with 317 track circuits.



A colour light junction signal of the three-aspect type at Wivelsfield, Sussex. B.R. Southern Region Official photograph.

Air News



By
John W. R.
Taylor

Rotodynes for New York

The announcement that New York Airways have ordered five Fairey Rotodyne vertical take-off air liners, with an option on 15 more, is proof that Britain's helicopter industry now leads the world. Our export drive will benefit to the extent of about £500,000 for every one of these aircraft bought by the Americans. In return they will get machines of unrivalled performance.

In place of the 3,000 h.p. Napier Eland turboprops fitted to the prototype, the New York Airways Rotodynes will each be powered by two 5,000 h.p. Rolls-Royce Tynes. This will enable them to carry 57 passengers on 250-mile stages at a cruising speed of over 200 m.p.h., which is faster than the speed record of 190.9 m.p.h. set up by the prototype last January. Maximum payload will be 65 passengers or eight tons of freight for 120 miles, with a maximum range of 650 miles when carrying a reduced load.

Fairey expect to have the first Tyne-Rotodyne flying in the autumn of 1961, and delivery of the initial batch of five aircraft to New York Airways will be completed by the early spring of 1964. It must now be hoped that B.E.A. will show equal confidence in this fine British air liner, so that we may benefit from its time-saving capabilities as much as our friends in America.

Anti-sub. Helicopter

Another rotating-wing aircraft in the news is the Westland Wessex, illustrated at the top of this page. In this case, the airframe is of American design, being basically similar to that of the Sikorsky S-58; but Westland have replaced the original Wright piston-engine with a 1,430 h.p. Napier Gazelle shaft-turbine, giving considerably improved performance.

The Wessex is in production for the Royal Navy and will eventually take over all the anti-submarine search and strike duties now performed by fixed-wing Gannets and Whirlwind helicopters. Its equipment will include dipping asdic radar, which is lowered into the sea at the end of a cable to 'listen' for enemy submarines, and it will be armed with homing torpedoes.

A point of particular interest to model-makers is that the Wessex is painted in the latest Fleet Air Arm anti-submarine helicopter colour scheme of dark blue with yellow top surface and white lettering.

The picture at the head of the page shows the Westland Wessex, the anti-submarine helicopter now in production for the Royal Navy.

Glowing Tails

Hunting-Clan Air Transport have decided to paint the tails of their Viscount and DC-6 air liners with 'rocket red' fluorescent paint. Experiments have shown that the use of such paint makes aircraft much more conspicuous, especially in hazy conditions and at dawn or dusk when normal colours become less easy to see, and so reduces the danger of collision.

The U.S. Air Force and many U.S. private owners have used fluorescent paint on the tails and wing tips of passenger-carrying aircraft, freighters and trainers for some time. The Ministry of Transport and Civil Aviation and Hunting-Clan are the first operators in Britain to adopt the new safety aid for their fleets. In Australia, Trans-Australia Airlines have adopted fluorescent orange markings for their aircraft.

FIDO at London Airport?

Fog dispersal apparatus, used first by the wartime R.A.F. under the code-name of FIDO, may be installed at London Airport to prevent air liners

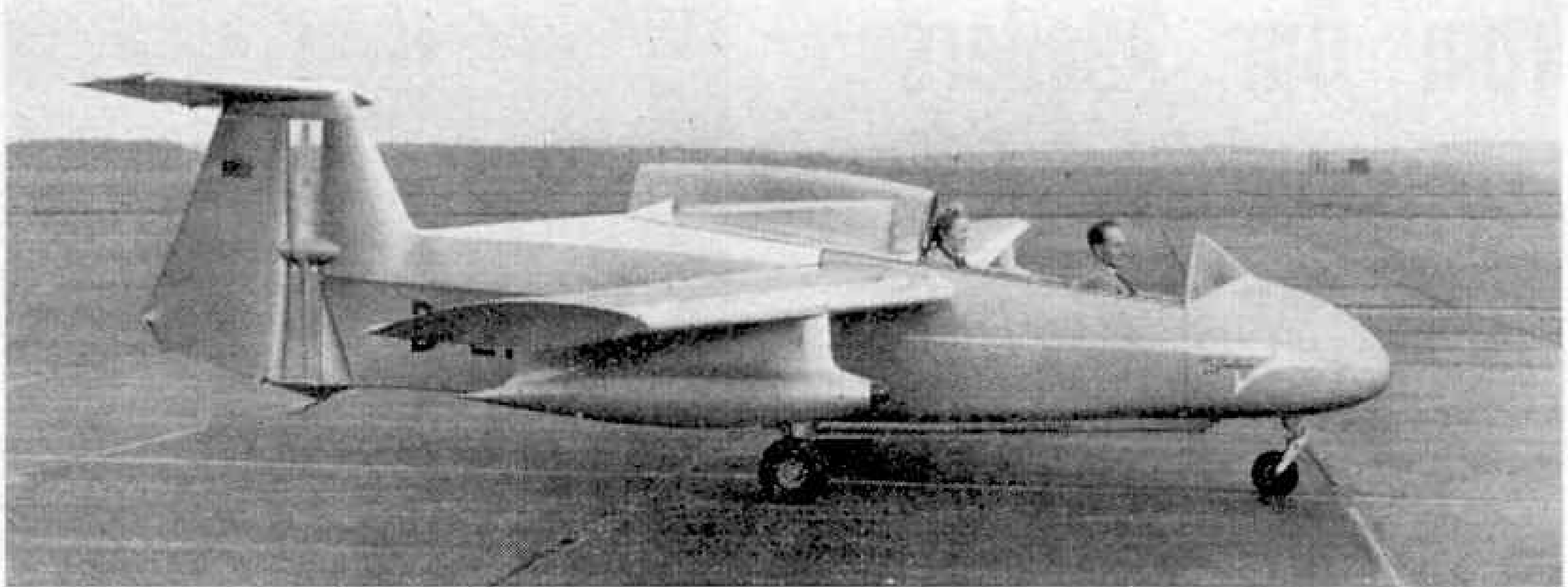
from being grounded so frequently by bad visibility. It consists of a series of fuel sprays down each side of the runway, which can be lit to burn away the fog while aircraft take off and land.

In the past FIDO has not been used widely for civil operations, except in emergencies, because of its high cost. But grounding in bad weather is also costly, and B.E.A. lost about £200,000 in three months last winter, when 1,370 of their services had to be cancelled because of fog.

If tests of a new type of FIDO by the R.A.F. prove its suitability for airline use, it is expected to be installed at London Airport within two years. Far more efficient and exciting is the automatic landing system which will be fitted first to B.E.A.'s D.H. 121 jet-liners in the mid-60's and eventually to all modern air liners, so that they can be brought in safely by radar without the pilot needing to handle their controls, even during the final touch-down.

* * * *

North American Aviation's new F-108 two-seat fighter will have two General Electric J93 turbojets, which will run on special chemical fuels. It is designed to intercept supersonic bombers at distances of up to 1,000 miles from its base, and will have a speed of about 2,000 m.p.h. at heights well over 60,000 ft.



This unusual aircraft is the German-built RW3 Multoplane. The propeller is mounted in a slot between the fin and the rudder.

Slotted Prop

One of the most unusual lightplanes flown in recent years is the two-seat RW3 Multoplane produced by the Rhein Flugzeugbau company of Krefeld, Germany. It began life as a powered sailplane, in which the pilot was able to take off without the usual towing and to switch off the engine at height when he wanted to glide and soar. The propeller was mounted in a slot between the fin and rudder, and so arranged that it came to a stop in a vertical position in the slot when the engine was shut off, so offering as little drag as possible.

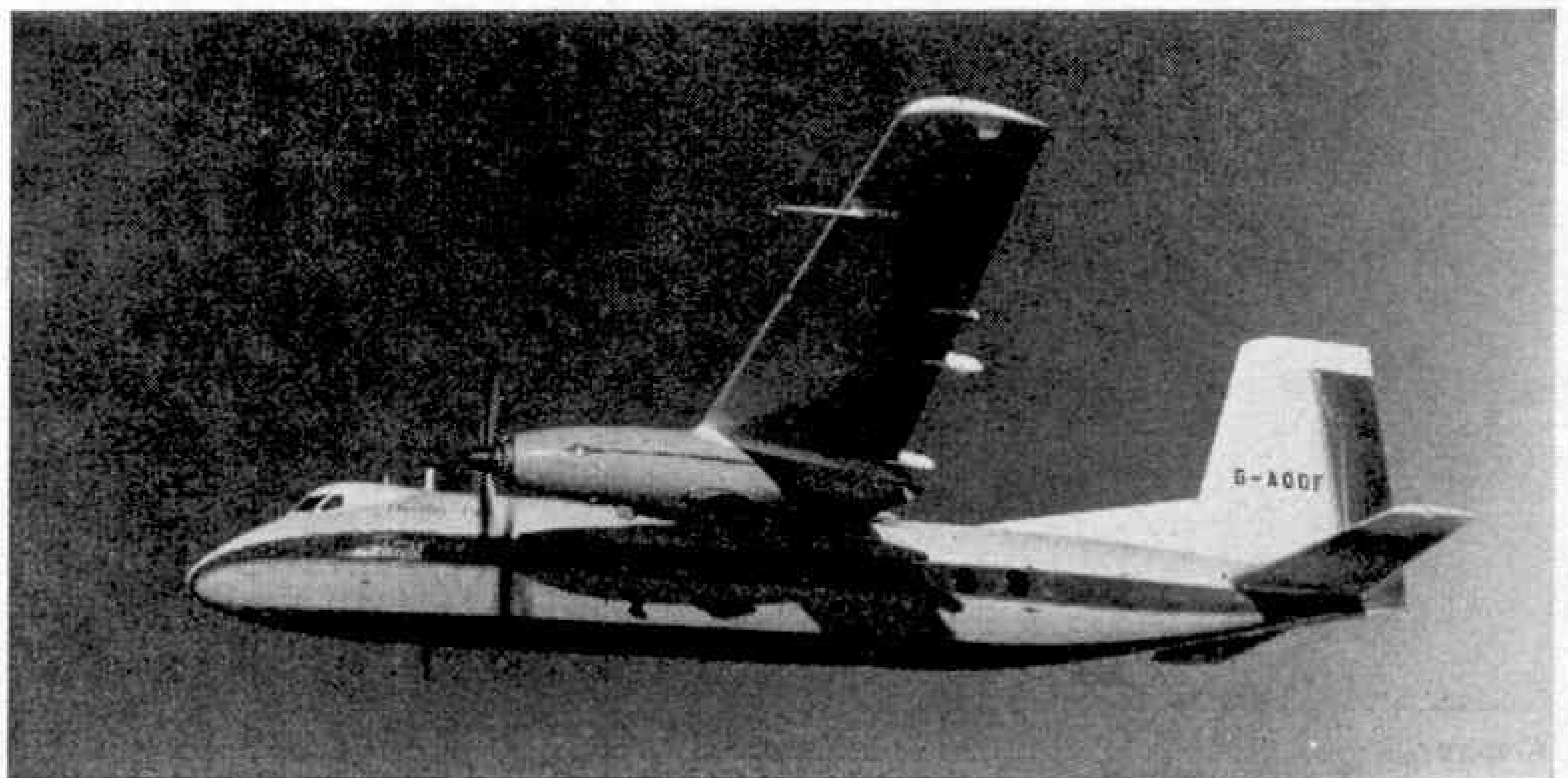
It was soon discovered that the aft position of the propeller gave such excellent efficiency and control that the Multoplane had the makings of a high-performance light aeroplane for normal powered flying. As a result, it is now available with two sets of wings for quick conversion from one role to the other.

With sailplane wings of 50 ft. 8½ in. span and underwing fuel tanks, as illustrated above, the Multoplane is suitable for gliding, training, club flying and touring, with the ability to take off in only 262 yds. and to soar for long periods. With shorter wings of 34 ft. 2½ in. span and wingtip tanks, it has a top speed of 132 m.p.h. and range of 1,130 miles at 118 m.p.h. In each case it is powered by a 65 h.p. Porsche 678/0 four-cylinder engine and weighs 1,940 lb. fully-loaded.

Helicopter Display

Readers who are able to get to Woburn Abbey, Bedfordshire, on the 10th of this month can be assured of plenty of excitement at Britain's first Helicopter Rally. Items on the programme are expected to include demonstrations of the little ramjet-powered Kolibrie from Holland and of air/sea rescue techniques by a U.S. military helicopter, as well as a fly-past by a home-built rotor-glider.

A good picture of a Handley Page Dart Herald in the air.



Herald on Tour

Handley Page's splendid little Herald air liner has begun a series of demonstration flights that will prove its ability to bring the comfort and speed of turboprop travel to even the smallest airports. Officials of airlines and air forces in Europe, India, and other Asian countries are being invited to see it, fly in it, and even pilot it under the skilled guidance of Sqd. Ldr. H. G. Hazelden, the company's chief test pilot.

Powered by two 2,100 h.p. Rolls-Royce Dart 527 turboprops, the Herald will carry up to 47 passengers, over five tons of cargo, or a mixture of the two at a cruising speed of 275 m.p.h. It has a maximum range of 1,430 miles but will make money on even short inter-city routes. What is more, its ability to take off and land in short distances makes it an ideal tactical troop transport and military supply aircraft.

* * * *

The Czech aircraft industry received a record order for light aircraft for a single customer last year, when the Soviet airline Aeroflot bought 130 twin-engined Super Aero 45s. This machine can carry a pilot and three passengers.

* * * *

Aer Lingus pilots now get their pre-flight weather briefing at Dublin Airport over a closed circuit television system. Because of Dublin's growing traffic, the Operations Room was moved recently from the Terminal Building to another part of the Airport. Use of a TV link between the Ops Room and the Meteorological Office in the Terminal saves the pilot a 20 min. walk between the two.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

A Worthy Veteran

Last December my younger brother and I were privileged to travel in a special train that ran from Christchurch to Lyttleton by way of the $1\frac{5}{8}$ miles long Lyttleton Tunnel. The excursion was organised by the Canterbury branch of the New Zealand Railway and Locomotive Society.

The Lyttleton Tunnel was electrified in 1929 and normal rail traffic through it is handled by electric locomotives. So it was quite an innovation to travel to Lyttleton by steam train. The engine was one of New Zealand's veteran "F" class 0-6-0 engines, originally named *Peveril*, the only remaining member of the class still running in New Zealand. *Peveril* was built in 1872 by Neilson and Co., Glasgow, and was designated "F"13 when numbering of N.Z. Government locomotives came about.

The three cars which comprised the train were not quite as old as the engine, for they



This veteran locomotive, built in 1872, presents a wonderful sight as it emerges from Lyttleton Tunnel, New Zealand, at the head of a special.

were built at Hillside and Addington workshops between 1898 and 1906.

After 86 years of service it would be fitting if *Peveril* were mounted on a pedestal in the new Christchurch station.

G. S. RIGGS

(Christchurch, N.Z.)

A Lone Spire

My photograph was taken from the tower of Worcester Cathedral. The spire in the middle of the picture is that of the former St. Andrews Church, which was demolished after the last war. It is 245 feet high and rests on a base only 20 feet in diameter! I discovered on a recent visit to the city that local people often refer to the steeple as "The Glovers Needle" because of its resemblance to the needle used in the gloving trade, and the buildings in the foreground indeed are those of one of Worcester's famous glove factories.

D. H. NORMAN (Ickenham).



A spire without a church. It was that of St. Andrews, Worcester, which was demolished after the second World War.

MECCANO MAGAZINE



Junior Section

Dunstable Hospital, when presents from Meccano Limited were being distributed. Barry Glenville is seen receiving a Meccano Outfit from the hands of Miss M. E. Redman, M.B.E., Chairman of the Luton and Dunstable Ladies' Guild. On her right are Mrs. G. C. Squires, J.P., Honorary Secretary of the Guild, and Sister Cannon, with Maureen Korkett, another patient.

Meccano Limited sends parcels of its products to many childrens' hospitals and orphanages every Christmas, and this photograph is a pleasant reminder of the pleasure that this practice brings to the children in them.

THE strange object seen in the picture above, which comes from R. W. Marjoram, Beckenham, Kent, is a picturesque Austrian sign that a new building, in this case an hotel, has been completed—houses normally have a small decorated "Christmas Tree" fixed to their roofs. The three hoops seen on the pole are suspended by wires and sway in the wind, and both they and the spiral wrapped round the pole are made of lichens and leaves. At the top is a small fir tree.

Our lower picture shows a scene last Christmas in the Childrens' Annexe of the Luton and



Easy Model-Building

"Spanner's" Special Section for Juniors

Water Well

An attractive subject for very young model-builders is the little Water Well shown in Fig. 1. This model was designed by Jeremy Denvill, Cheam, Surrey, and can be built from parts in Outfit No. 2.

Jeremy is just over eight years of age, and when he sent us the details of his model he said that "his mummy thought of it, his daddy drew it, and he made it". Surely this is an excellent example of clarity and brevity in speech! Congratulations Jeremy.

To make the base of the Well you will need two $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plates. To commence you should bolt the Plates together end to end and then curve them to form a cylinder. Now bolt the two ends together. If you bend the Plates very carefully, you will be able to flatten them out again after the model is taken to pieces simply by placing them between two pieces of wood and pressing or hammering on the upper piece.

To the cylinder you have formed you must now bolt two $5\frac{1}{2}"$ Strips 1 and 2, opposite to each other. To the top end of one of the Strips bolt an Angle Bracket 3 and fix to the Angle Bracket a Fishplate 4. To the top of the other Strip fix an Angle Bracket only. Now join this Angle Bracket to the Fishplate by bolting between them a $2\frac{1}{2}"$ Strip 5.

The bucket winding handle is a Crank Handle with grip, and it is passed through holes in the two $5\frac{1}{2}"$ Strips as shown. Now

fix the Crank Handle in place by placing on it two Spring Clips. Tie a length of Cord to the centre of the Crank Handle, or better still use a Cord Anchoring Spring if one is available. Now tie the other end of the Cord to a small Loaded Hook.

To use the model you can stand it on a fairly deep cardboard box, in the top of which you should cut a round hole somewhat smaller than the Wall of the Well, but big enough to allow the bucket to go through. For a bucket you can use a small tin with a piece of Cord attached to it so that you can hang it on the Well hook.

A list of the parts required to build the Water Well is given at the end of this article.

Veteran Car for Outfit No. 3

Here is an unusual and interesting model that should appeal to owners of an Outfit No. 3 or one larger. It is the Veteran Car shown in Figs. 2 and 3. The radiator of this is formed by two Flat Trunnions bolted together as shown. The lower Flat Trunnion is bolted to a Trunnion 1, and the bolts fixing this in place fix also two Angle Brackets to which

the $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates that form the sides of the bonnet are bolted and two $5\frac{1}{2}"$ Strips forming the chassis. The front wheels are mounted on a Rod carried in the lugs of a $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 2 that is pivoted on a lock-nutted bolt 3 passed through the apex hole of the Trunnion 1.

The next step is to fix a $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate to two Angle Brackets that are bolted to the sides of the bonnet. One of the Angle Brackets is seen at 4. A Reversed

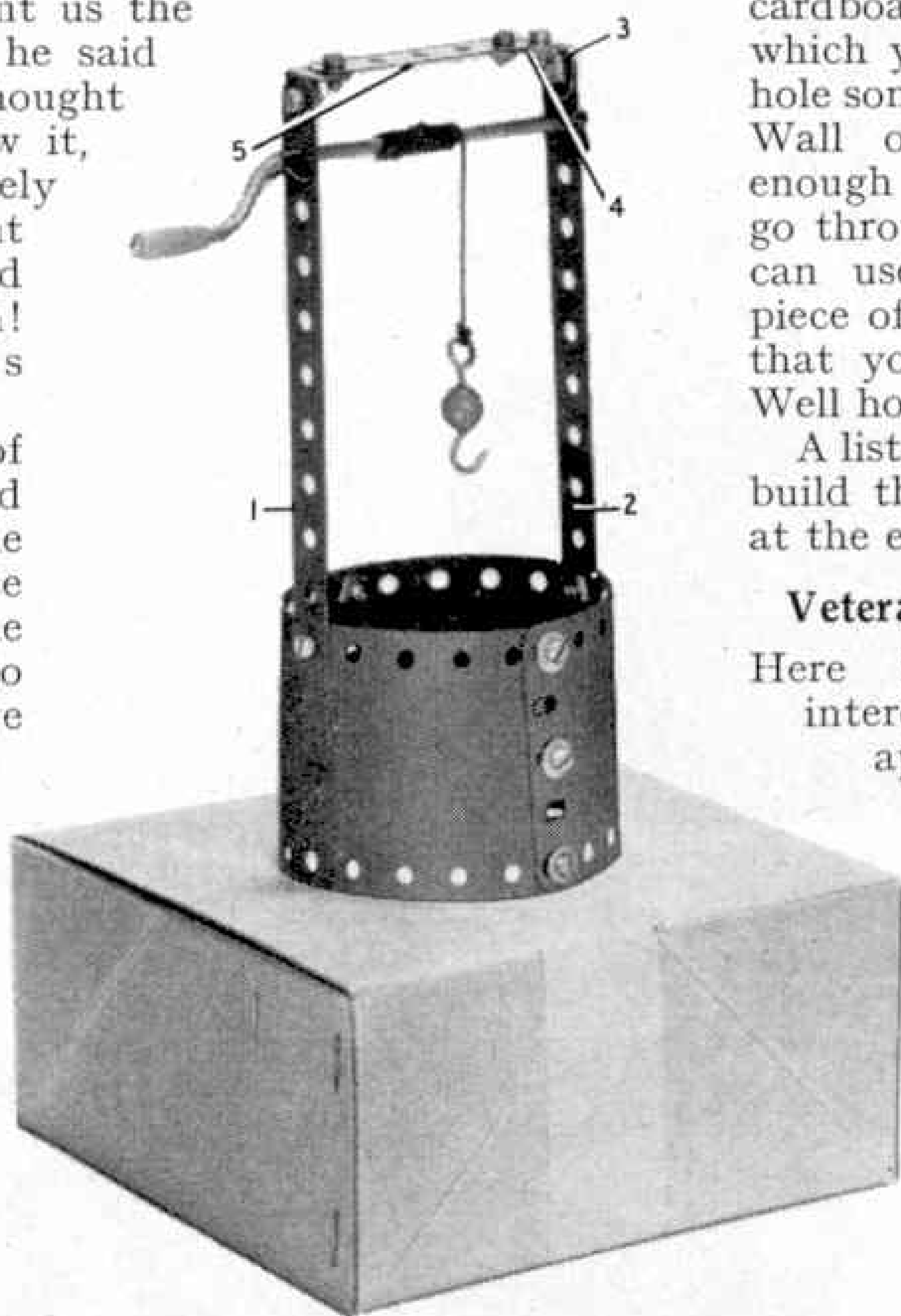


Fig. 1. A Water Well that can be built from parts in Outfit No. 2.

Angle Bracket is bolted at each side in the fourth hole from the rear of the $5\frac{1}{2}$ " Strips. The upper lug of each Reversed Angle Bracket is bolted to the $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plate and a $2\frac{1}{2}$ " Strip 5 is held by the same bolt. The floor of the car is a $2\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate, which is bolted to the Reversed Angle Brackets. A bolt fixes a $2\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strip and a $4\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate to the ends of the two Strips and the Flexible Plate is curved to shape as shown.

The seat is a $2\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate, which is fixed to a Trunnion bolted to the rear of the $4\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate. The $2\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate is curved to the appropriate shape. A $2\frac{1}{2}$ " Stepped Curved Strip 6 is bolted to each side of the vehicle and to an Angle Bracket 7 on each side, a Formed Slotted Strip is fixed. These Strips represent the rear mudguards, and four $2\frac{1}{2}$ " Strips, suitably bent to shape, form the front mudguards. The $2\frac{1}{2}$ " Strips are connected by a Fishplate.

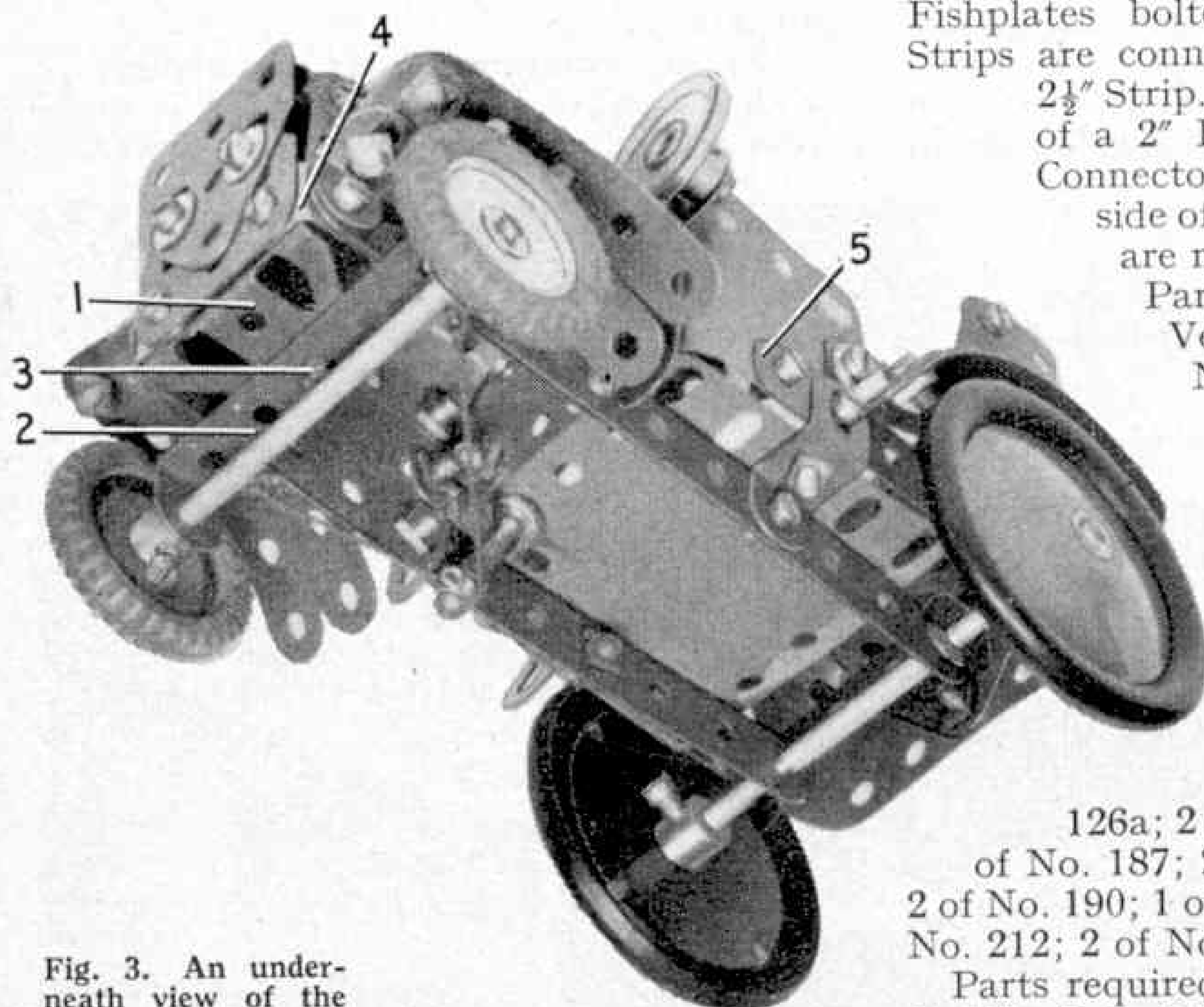


Fig. 3. An underneath view of the Veteran Car.

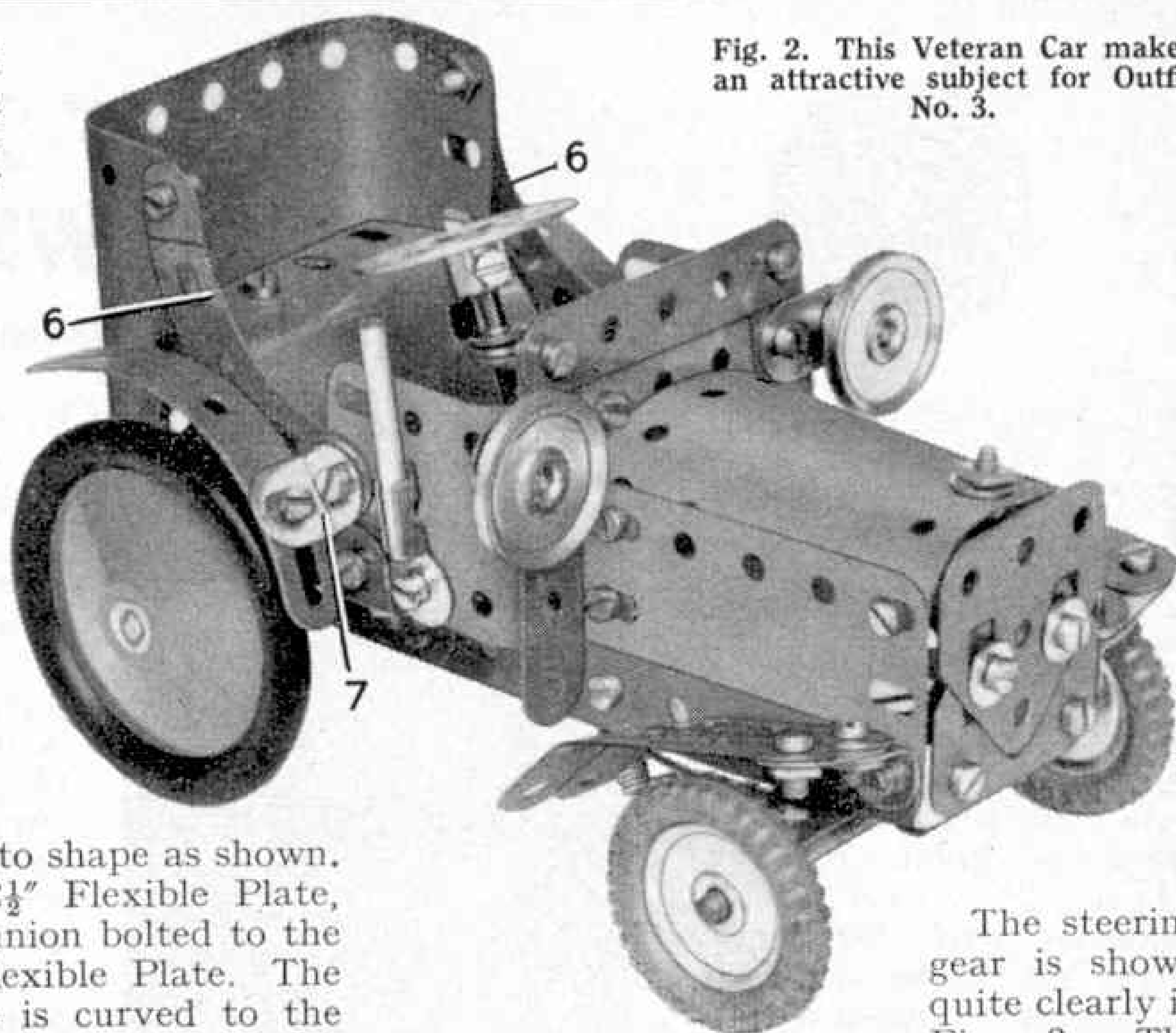


Fig. 2. This Veteran Car makes an attractive subject for Outfit No. 3.

The steering gear is shown quite clearly in Fig. 3. The

steering column is mounted in a Fishplate and the floor of the car, and a length of Cord is wound round the bottom end of it. A Cord Anchoring Spring prevents the Cord slipping off the Rod. One end of the Cord is tied to each side of the Double Angle Strip.

The headlamps are 1" Pulleys held on $\frac{3}{8}$ " Bolts passed through the round holes of Fishplates bolted to $2\frac{1}{2}$ " Strips. These Strips are connected together by a third $2\frac{1}{2}$ " Strip. The handbrake is made up of a 2" Rod and a Rod and Strip Connector fixed by locknuts to the side of the car. The Road Wheels are mounted on a $3\frac{1}{2}$ " Rod.

Parts required to build the Veteran Car: 2 of No. 2; 9 of No. 5; 5 of No. 10; 1 of No. 11; 8 of No. 12; 1 of No. 15b; 2 of No. 16; 1 of No. 18a; 4 of No. 22; 1 of No. 24; 4 of No. 35; 47 of No. 37a; 46 of No. 37b; 10 of No. 38; 1 of No. 40; 2 of No. 48a; 2 of No. 90a; 2 of No. 111c; 2 of No. 125; 2 of No. 126; 2 of No. 126a; 2 of No. 142c; 1 of No. 176; 2 of No. 187; 2 of No. 188; 1 of No. 189; 2 of No. 190; 1 of No. 191; 1 of No. 200; 1 of No. 212; 2 of No. 215.

Parts required to build the Water Well: 2 of No. 2; 1 of No. 5; 1 of No. 10; 2 of No. 12; 1 of No. 19g; 2 of No. 35; 13 of No. 37; 1 of No. 57c; 2 of No. 192.



DINKY TOYS NEWS

By **THE TOYMAN**

THE enthusiastic Dinky Toys collector shown in the illustration at the foot of this page is Peter Green, who comes from Shrewsbury. Peter, of course, is a member of the Dinky Toys Club. It is quite evident from the picture that he gains a great deal of pleasure from his activities with his Dinky Toys. As can be seen in it, he has built himself a race-track layout and at the time the photograph was taken a race was in progress. Perhaps the most notable feature of his track is the large white building in the foreground. This houses the "pits" where the racing cars can stop to refuel or for any necessary adjustments or repairs.

I must congratulate Peter on the ingenuity he has shown in the construction



This cheerful young Dinky Toys collector, is Christopher Harland, who lives at Brighton.

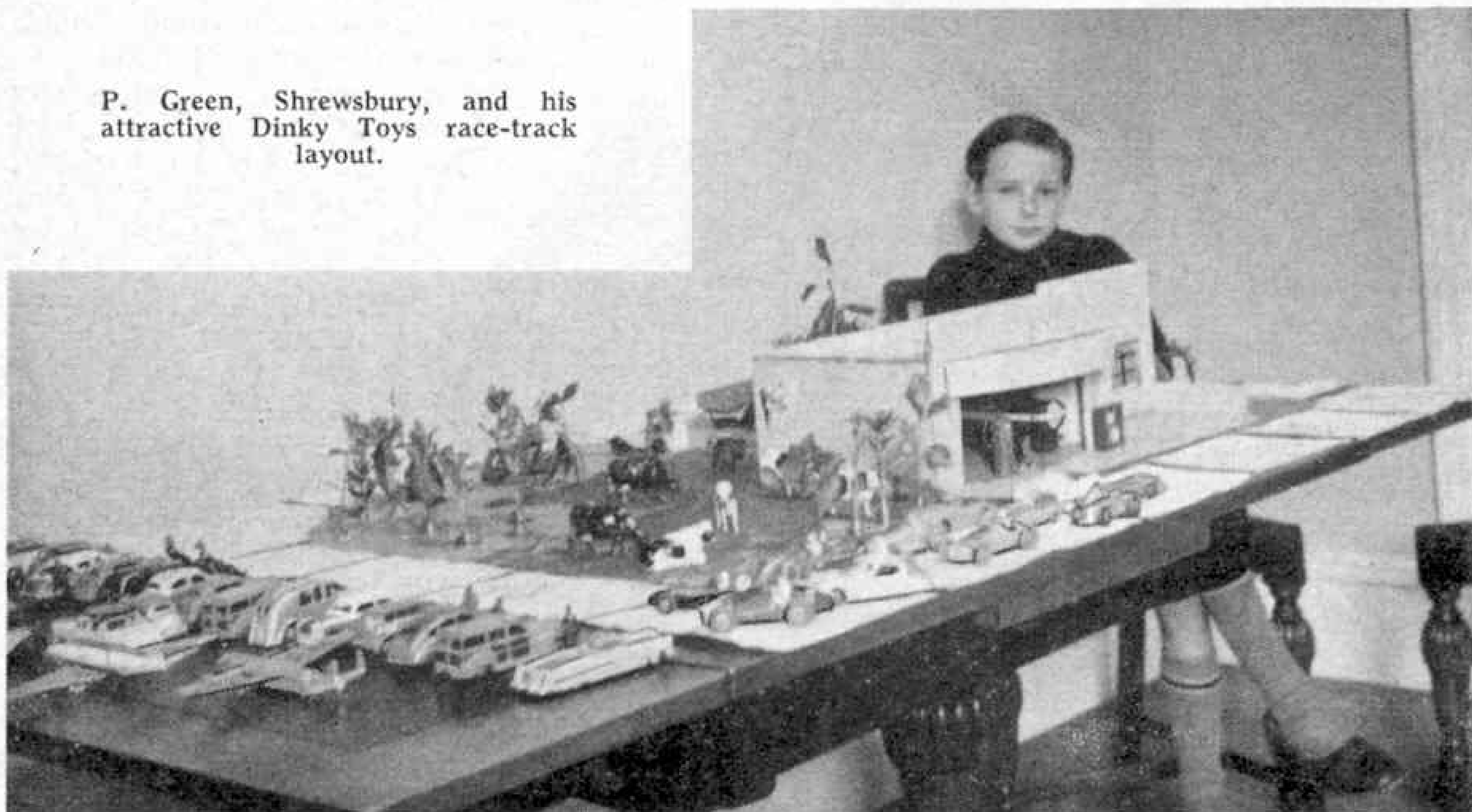
of this layout. It is different in many ways from any other that I have seen and Peter tells me that an added attraction is that it can be put away quite easily. It is in fact built on a large rectangular sheet of brown paper and the track only is painted white, the centre receiving no treatment whatsoever.

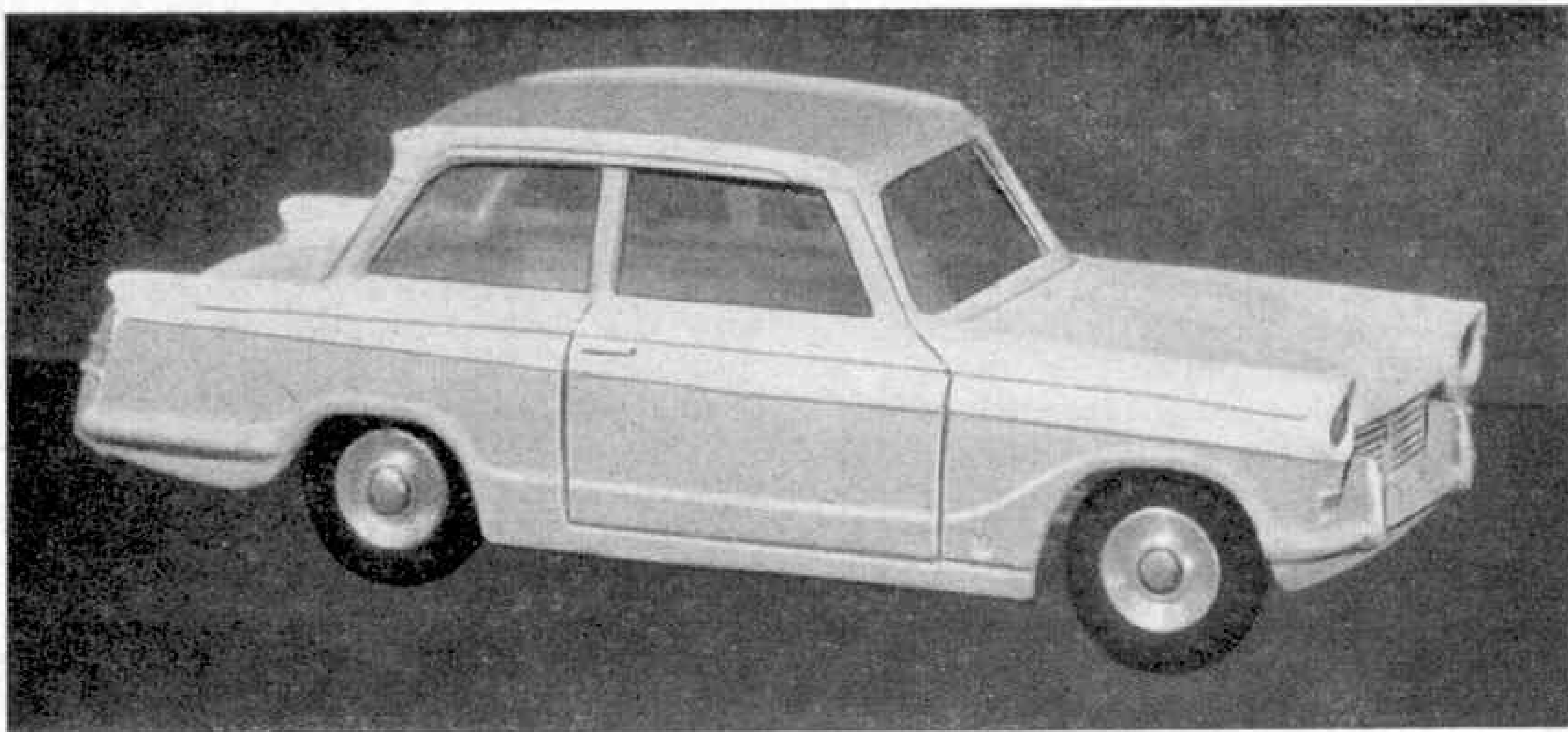
Some of you may be wondering what is the purpose of the black lines on the track. Well, Peter saw a description in the Dinky News pages of a past issue of the Magazine of a layout arranged so that it could be used also for a dice game! He decided that he too would build a dual

purpose layout.

Another interesting feature of the layout is that the trees, each of which is made from a small twig, are fixed in the bosses of

P. Green, Shrewsbury, and his attractive Dinky Toys race-track layout.





An up-to-the-minute Dinky Toy! This is the fine model of the Triumph Herald, announced late last month. It is unique because its appearance in the shops was planned to coincide with the release of the actual car by the manufacturers.

1" Meccano Pulleys! Various Dinky Toys vehicles are parked around the centre of the layout and these form only a small portion of Peter's large collection. He told me that at the time of writing to me he had seventy-five Dinky Toys and I am sure that he has more now.

The first new Dinky Toy this month already has the special added interest of having created a record! It is a beautifully moulded and colourfully finished miniature of that fine new car, the Triumph Herald, which was announced by the Standard Motor Co. Ltd. late last month. So here Dinky Toys owners have the opportunity

to take part in a unique occasion; for never before in the history of the motor car, so far as I know at least, has a Dinky Toy, or indeed any die-cast miniature, been planned to be available to enthusiasts at practically the same time as the actual car it represents.

The new Saloon is shown in the upper illustration on this page, and in the lower picture it is shown incorporated in an attractive and realistic setting of a motor speedway. A glance at these illustrations is enough to show how modern the car is in styling. It is distinguished by its all-round merits, for every detail has been



The Triumph Herald incorporated in a motorway scene, together with several other popular Dinky Toys cars, including the Rolls-Royce Silver Wraith.

carefully planned to make both driving and travel in it a most satisfying experience. One feature that is illustrated by the pictures of the miniature, for instance, is the splendid all-round view it gives its occupants. I shall be having more to say about this fine miniature next month. By the way, this new Dinky Toy is No. 189.

The second new Dinky this month, a Supertoy, is another delight for enthusiasts. It is a unique and a splendid one, of the B.B.C. Roving Eye Vehicle, its Dinky Supertoy number being 968. Every TV fan and, I imagine, every *M.M.* reader, will be familiar with the "Roving Eye" of the B.B.C. even if he or she has not seen the actual vehicle, for pictures of it have often appeared in B.B.C. and other publications. So you will all be able to appreciate the realism of the new Dinky Toy from the picture reproduced here—and also from the real thing when you have it safely recorded in your Dinky Toys Collectors' Licence!

The Roving Eye vehicle attends all kinds of outdoor sporting and other events and is equipped with all the latest television apparatus required to bring "on the spot" live broadcasts to our TV screens.

The Dinky Supertoys Roving Eye Vehicle is scaled down from drawings of the actual vehicle and has many finely moulded details, with transparent windows in the cab and opaque green windows in the body. The camera and cameraman are mounted in a turret sunk in the roof of the vehicle, and this can be turned round so that the camera can be pointed in any direction. The model is finished in a similar shade of dark green to that used on the actual vehicle.

I was unable to mention last month the two new Dinky Toys that appeared in the shops in April and, in case you have not yet by any chance seen them, these were a splendid model of the Bristol Britannia Airliner (Dinky Toys No. 998) and an addition to the range of Dublo Dinky Toys, a Royal Mail Van (No. 068).

Many collectors have told me that they have been eagerly awaiting an addition to the range of aircraft models, and here is a

real gem for them. It is indeed already evident from my correspondence that the new Dinky Toys aircraft has pleased these collectors very much.

Here are a few details of the actual aircraft for your records. The first prototype Bristol Britannia flew on 16th August 1952, and the first production model on 15th September 1954. Several versions are available, and in service in various airlines. British Overseas Airways have over 30 Britannias, and



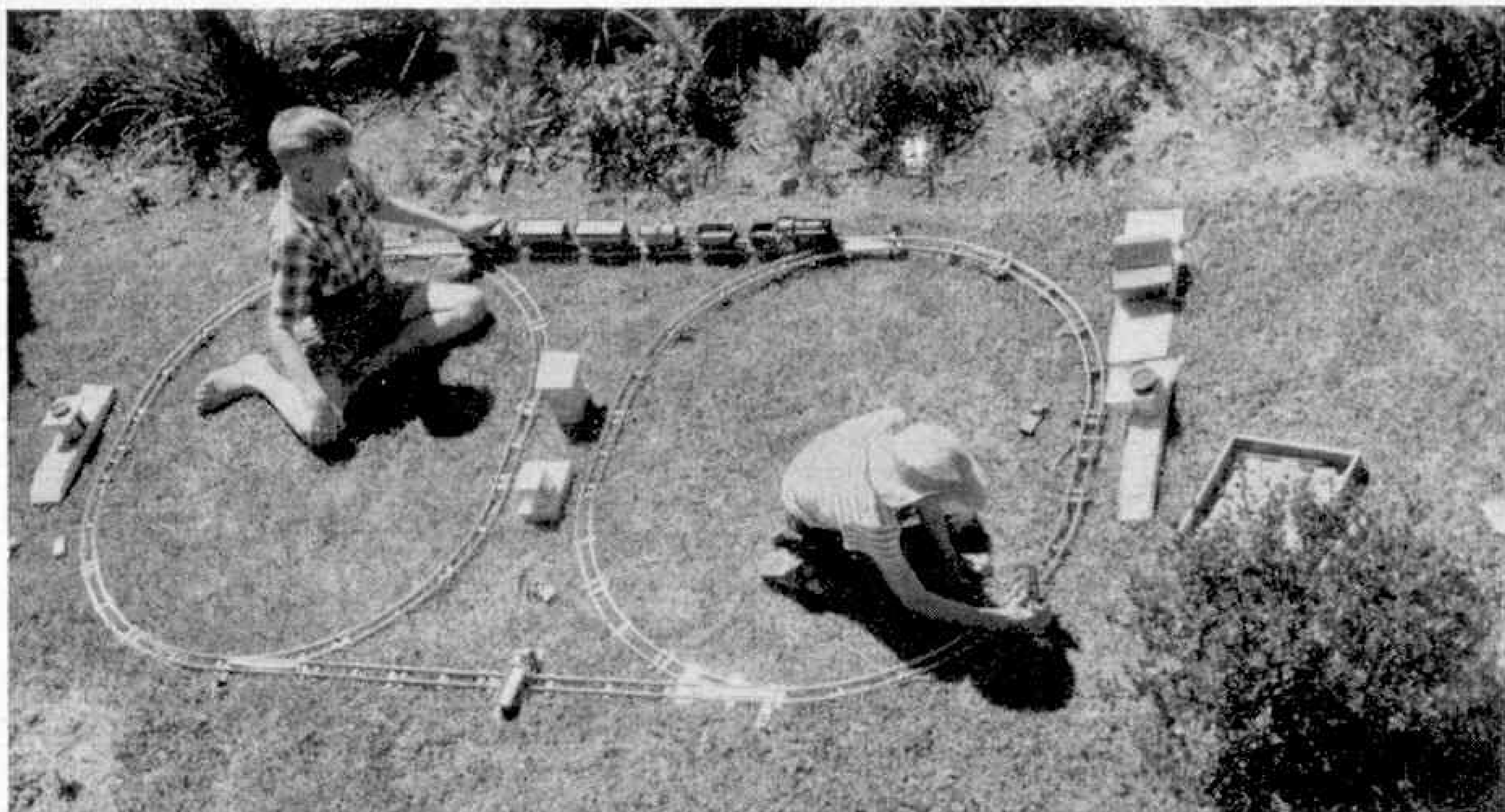
Dinky Toys enthusiasts will want to add this finely detailed model of a B.B.C. Roving Eye TV Vehicle to their collection.

foreign airlines using them include Canadian Pacific Airlines, El Al (Israel), Cubana (Cuba) and Aeronaves (Mexico). Britannias for all-cargo operation and troop carrying have been ordered for R.A.F. Transport Command, and the Ministry of Supply also has ordered a passenger cargo version of this aircraft.

The Britannia is fitted with four Bristol Proteus turboprops, and the Series 310 has a cruising speed of 400 m.p.h. at 21,000 ft. It can be equipped to carry from 99 to 133 passengers. It is remarkable for its extreme quietness in flight, which has earned for it the name of the "Whispering Giant".

The Dinky Toys Bristol Britannia is an accurately detailed miniature and is superbly finished in Canadian Pacific colours of blue, silver grey and white. It has a wing span of 87½ in.

The Dublo Dinky Toys Royal Mail Van No. 068 is just the thing for taking deliveries from a Hornby-Dublo Railway.



David Greig, Wellington, New Zealand, adds the Brake Van to the train, while his friend places a Signal in position at the lineside. In suitable conditions such as those apparent here, layouts out-of-doors can be great fun.

"Tommy Dodd" writes about:

A Layout on the Lawn

I KNOW that it is a bit early to talk about Hornby railways out-of-doors, but I cannot resist the temptation to show you the photograph reproduced above, in which two Hornby railway enthusiasts are obviously having fun. David Greig, of Wellington, New Zealand, and his friend have taken advantage of fine weather and of the space available out-of-doors to put down the fairly extensive railway seen in the picture.

The track is almost exactly the same as that shown in Layout 0.20 in the leaflet *Layout Suggestions for Clockwork Track*, with which most of you will be familiar. That diagram shows how to build up the system with either 2 ft. or 1 ft. radius Curved Rails and Points. Don't forget you cannot mix the two sizes successfully on the same railway. Any Hornby Gauge 0 railwayman who has not a copy of the leaflet mentioned can get one by writing to Headquarters. There is no charge for it.

The track with which our New Zealand friends are so busy takes the form of an extended oval with two centre loops which provide some useful working possibilities. It seems as though the enthusiasts in the picture have just one train, and David is

making sure that the engine has a respectable load to pull, for the extent of the layout with its straight stretches of track encourages much better performance than is possible on a plain circle.

But two trains could be successfully managed by two operators on a railway like this. The two trains would each keep to the respective circuits in which the boys are sitting, and with smart operation of the Points the trains could be made to change circuits from time to time. Still, even with one train there is plenty of fun to be had, particularly if there are wayside places where the train can be made to stop, as there are in the picture. There is in fact a Brake Rail for this purpose alongside the platform at the right hand of the layout.

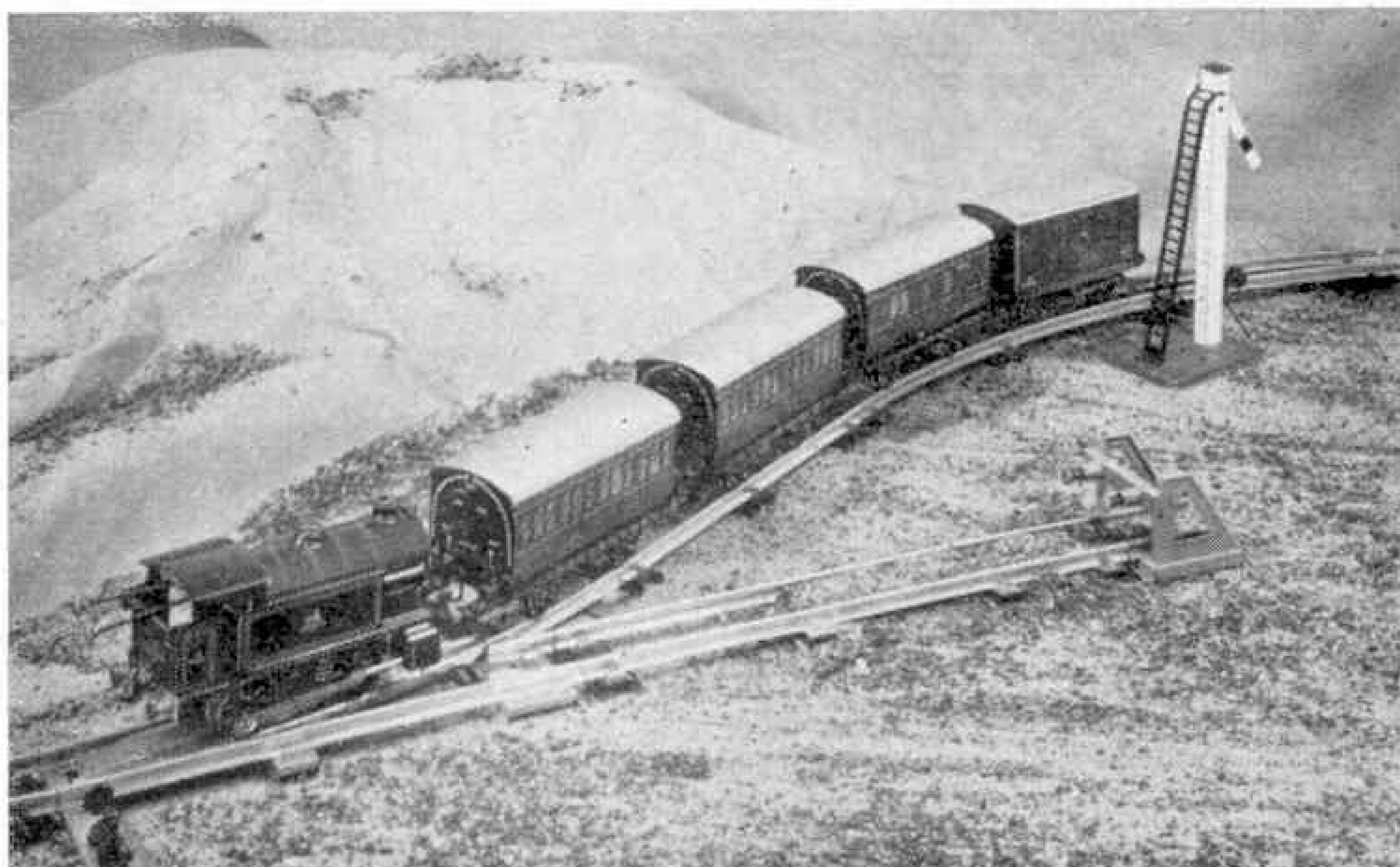
This is the sort of railway that can provide plenty of fun, and we can be sure that after our friends had put the railway down and the photograph had been taken, they continued to play with it for quite a long time. You will notice that in the foreground a Dinky Toys No. 409 Bedford Articulated Lorry is making what appears to be a somewhat unorthodox crossing of the railway line. If a Hornby Level Crossing is not available for such purposes, it is not

difficult to make a crossing and its approaches from cardboard, wood or other suitable material, and this is exactly what the boys have done, although the crossing can barely be detected in the illustration. Outdoor situations usually encourage ingenuity in various directions.

I hope to be able to deal more fully with this sort of thing later, when the season for railways in the garden is a little more advanced. At home here we have to keep one eye on the weather when doing our garden railwaying! Fine and dry conditions are essential, and it must be warm. Train running out-of-doors can be a somewhat bleak business if it is not. If some of you want to make an early start, given the conditions, remember that if your railway is on the lawn, with permission, this site must be nicely level, with the grass cut quite short. Otherwise you may be in trouble.

Coming back to the train being put together on the New Zealand railway that we have been talking about, you will notice that the formation is a mixed one, an arrangement often found in overseas countries. There are freight vehicles as

A local train with a Hornby No. 40 Tank Locomotive makes its way past the background hill.



well as passenger coaches and the freight stock is coupled next to the engine. A somewhat different state of affairs is shown in the picture above, where a miniature branch line train representing B.R. practice is winding its way through a reverse curve. Hornby No. 41 Coaches and a similar Passenger Brake Van make up the passenger and luggage part of the train, but there is right at the tail a Hornby No. 50 Goods Van.

This is quite a suitable vehicle for running in a passenger train formation and you can see this sort of thing done in actual practice. A van may be needed for regular

traffic of some particular kind, or it may be used only occasionally. You can vary the circumstances on your Hornby railways just as you wish and, by the way, see that the Goods Van carries at the rear end the tail lamp normally carried by the Passenger Brake Van when it is the last vehicle in the train. The Goods Van, like all Hornby Vans of current type, has brackets for this very purpose.

You will notice that the straight route of the Points shown leads into a short spur ended by a Buffer Stop. Such a feature can be quite useful, as the Tank engine shown in the picture could stand there when not required for running. Of course the siding can be much longer with advantage, but it was kept short deliberately in this instance in order to get it well into the picture. A longer siding will be useful for Coaches not in use or even for a complete train, including the engine, if the main line is single track and there are two trains in service, each running in turn.

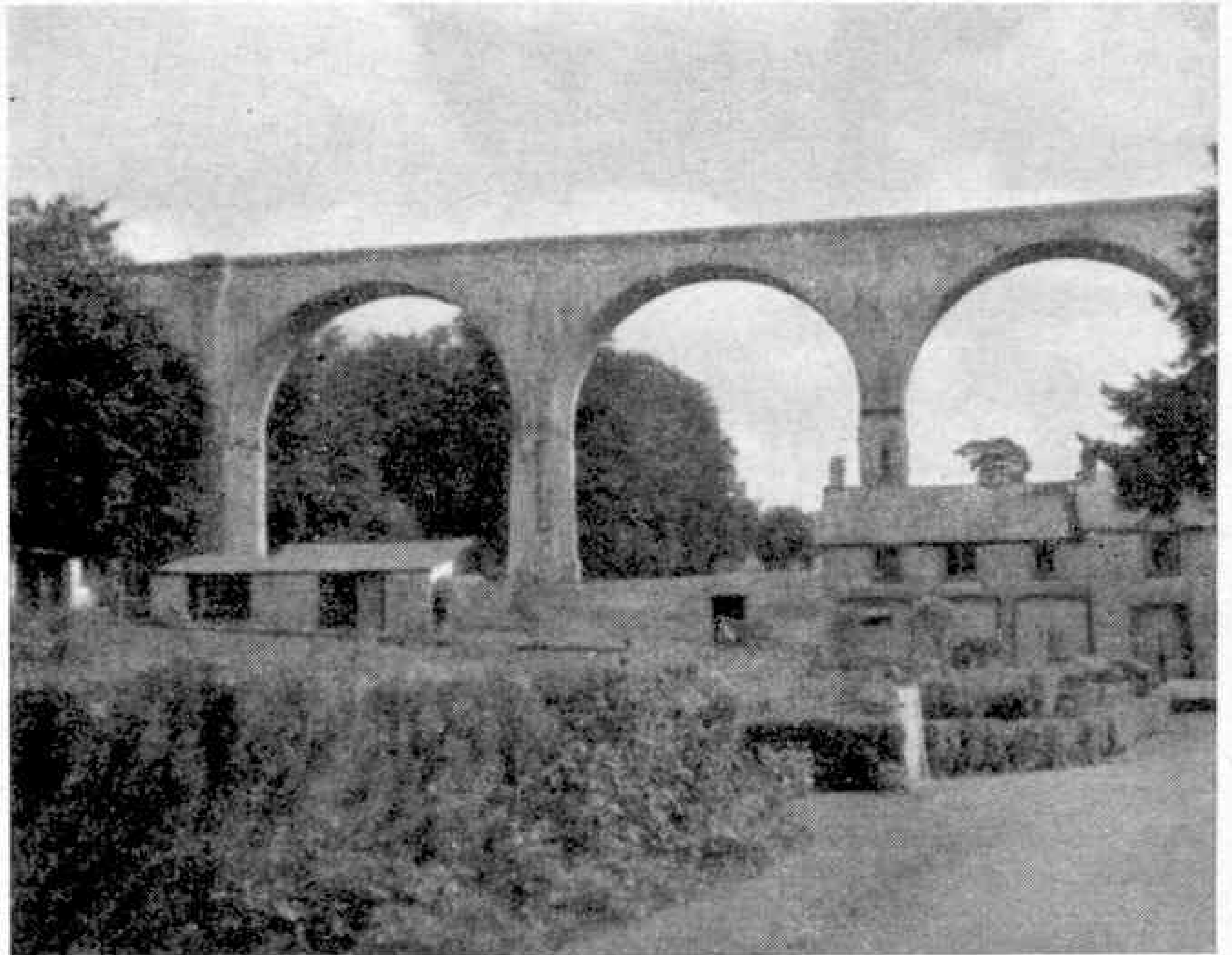
Some good running schemes of this kind can be worked out, possibly using a goods

and a passenger train alternately. Perhaps you may want to have two passenger trains, especially if you are working a busy rush-hour service. Then the fact that you can have a whole train "stored" ready for running when its turn comes saves time and trouble.

For such purposes a loop line is more useful than a siding. A train can enter or leave a loop at either end, but a dead-end siding involves some reversing, which takes up time that is valuable when a rush-hour service is being worked.

Of General Interest

THIS summer many of us will be travelling about the country on holiday, and no doubt will see many interesting and unusual things. Two excellent examples are pictured on this page. The first is Chelfham Viaduct, on the Lynton and Barnstaple narrow gauge railway, which was closed down and dismantled 23 years ago. It is good that the railway is still represented by this structure, which was its most impressive architectural feature. It crosses the Stoke Rivers valley at a height of 70 ft. Its cost was more than £6,000 and over a



quarter of a million bricks were used in its construction.

The photograph was submitted by H. Muir, Walthamstow, who also contributed these notes. A few miles away, he writes, are further relics of the railway, two carriages each standing on its own length of track, which is of 1 ft. 1½ in. gauge. One is used as a garden shed, and the other serves as a chicken house. Both are sadly dilapidated, but close inspection reveals the word "Southern" on their weather-beaten sides.

The Lynton and Barnstaple railway was bought by the Southern Railway in the 1920s. Ever increasing road competition and the high cost of maintaining the 19 miles of winding track made its closing necessary.

The second example is not quite so massive. J. V. Kirchavell, of Southampton came across the apparently unique thatched petrol pump seen in the accompanying picture during a recent journey through the Hampshire countryside. It is to be seen near the small village of Beauworth, about five miles south of New Alresford. It is set back from the road and does not appear to be part of a garage.





A down Kent Coast Express curving into Sevenoaks behind No. 30933 "King's-Canterbury", of the Schools class. Photograph by David Sellman.

are larger than in Britain, which is a great advantage. Large Bo-Bo locomotives taking current on the older 1,500-V. D.C. system maintain some of the fastest regular timings in the world on the southward main line between Paris-Dijon-Lyons, hauling heavy expresses.

The European Railways' Bulletin also reports that in view of last season's success, an extension is being made this year of Car-Sleeper services for motorists bound to tourist areas including Boulogne-Lyons, Paris-Avignon, and from Germany towards

Hamburg and elsewhere in Switzerland.

Railway Notes

By R. A. H. Weight

226 More Diesel-Electric Locomotives

British Railways have announced the largest orders for diesel-electric main line units since the introduction of their modernisation programme in 1955, the total being no fewer than 226. B.R. Works at Crewe and Derby will build 137, their power equipments to be supplied by Messrs. Crompton, Parkinson Ltd.; The English Electric Co. Ltd. will construct 72, and The British Thomson-Houston Co. Ltd. 17.

The first named largest group of locomotives will be rated Type 4, and will be of 2,300-2,500 h.p. for a maximum speed of 90 m.p.h. They are intended to haul express passenger or fast freight trains in the L.M. Region. The others will comprise a new design of 1,750 h.p., classified Type 3, with CC wheel arrangement (two six-wheeled bogies). Of these 42 are to be built for the E. and N.E. Regions. In addition there will be 30 of 1,000 h.p. and 17 of 800 h.p., both Type 1, mainly for freight duty in the Scottish, L.M. and Eastern Regions.

A number of these locomotives will be similar to those already in production. Deliveries will begin this year and they will be introduced progressively in areas earmarked for complete operation by diesel instead of steam power.

European Railway Developments

Overhead electric traction has been brought into use along the 160 miles between Paris and Lille, an important main line carrying heavy coal and freight and considerable passenger traffic. A new standard, high-power 50-cycle A.C. installation will be used. Other northward routes to the Belgian frontier, Dunkirk, etc., are intended to be similarly electrified soon, with associated new, powerful locomotive construction, improved signalling and track layout. In France clearance gauges at platforms and bridges

The Schools Class Engines Today

These monarchs of the 4-4-0 world, as I have deservedly described the S.R. 3-cylinder Schools in a previous contribution to the *M.M.*, have not been quite so much in evidence during the past winter, since nearly all the London-Tunbridge Wells-Hastings passenger services were taken over by diesel-electric multiple unit train sets. These run also between Charing Cross or Cannon Street and the Kent coast via Ashford, but only to a certain extent so far. There are a good many Pacific locomotives usually available for the latter route.

The able Schools still appear, however, on Kent coast expresses, on secondary line trains in the South Eastern Division and similarly from Brighton, Waterloo, Basingstoke, etc., or on various special duties over a wide area. When the heavy demands of the summer holiday season necessitate perhaps a trebling of the current locomotive rosters, particularly at weekends, they will probably be much busier again. As the main line to Margate and Ramsgate by way of Chatham-Faversham is being electrified in readiness for operation, chiefly by multiple unit sets, from the middle of June, there may well be a partial re-allocation of Schools and other engines at present stationed at Ramsgate. More than half are now painted green in B.R. express locomotive style.

Early in the New Year engines of this class ran a number of passenger train journeys along the Redhill-Guildford-Reading line. They were primarily designed for the steeply graded, difficult Hastings direct route to and from London, with its narrow tunnels between Tunbridge Wells and Battle, and a section of them performed well and regularly thereon as the almost exclusive type for principal trains for round about 25 years. Now there are normally only two such daily duties. I have reported various good runs in these notes with speeds up to 84-85 m.p.h. and some excellent hill climbing, gaining time in places with maximum loads of "11-on", or about 380 tons full.

For a long while Schools stationed at St. Leonards-on-Sea (Hastings) hauled the 7.27 a.m. up to Cannon Street, London, returning on the 5.6 p.m. Both these are heavily loaded business trains running without stop between Cannon Street and Tunbridge Wells, 33½ miles. By courtesy of a good friend who kept a keen look-out between 1951 and 1957, on most days if not quite continuously, I am able to quote the following striking examples of high total appearances of individual Schools on that turn: *Dulwich* on 187 days; *Merchant*

Tailors 170; *Tonbridge* and *St. Paul's* each 129; *Lancing* 116; *Winchester* 107; *Eton* and *Westminster* each 99; and *Wellington* 81. There were several spells by the same engine almost continuously for quite considerable periods.

Other similar sequences could no doubt be found there and elsewhere but the tendency nowadays, particularly where the runs and turns are much longer, is for locomotives to share a greater number of trains and destinations.

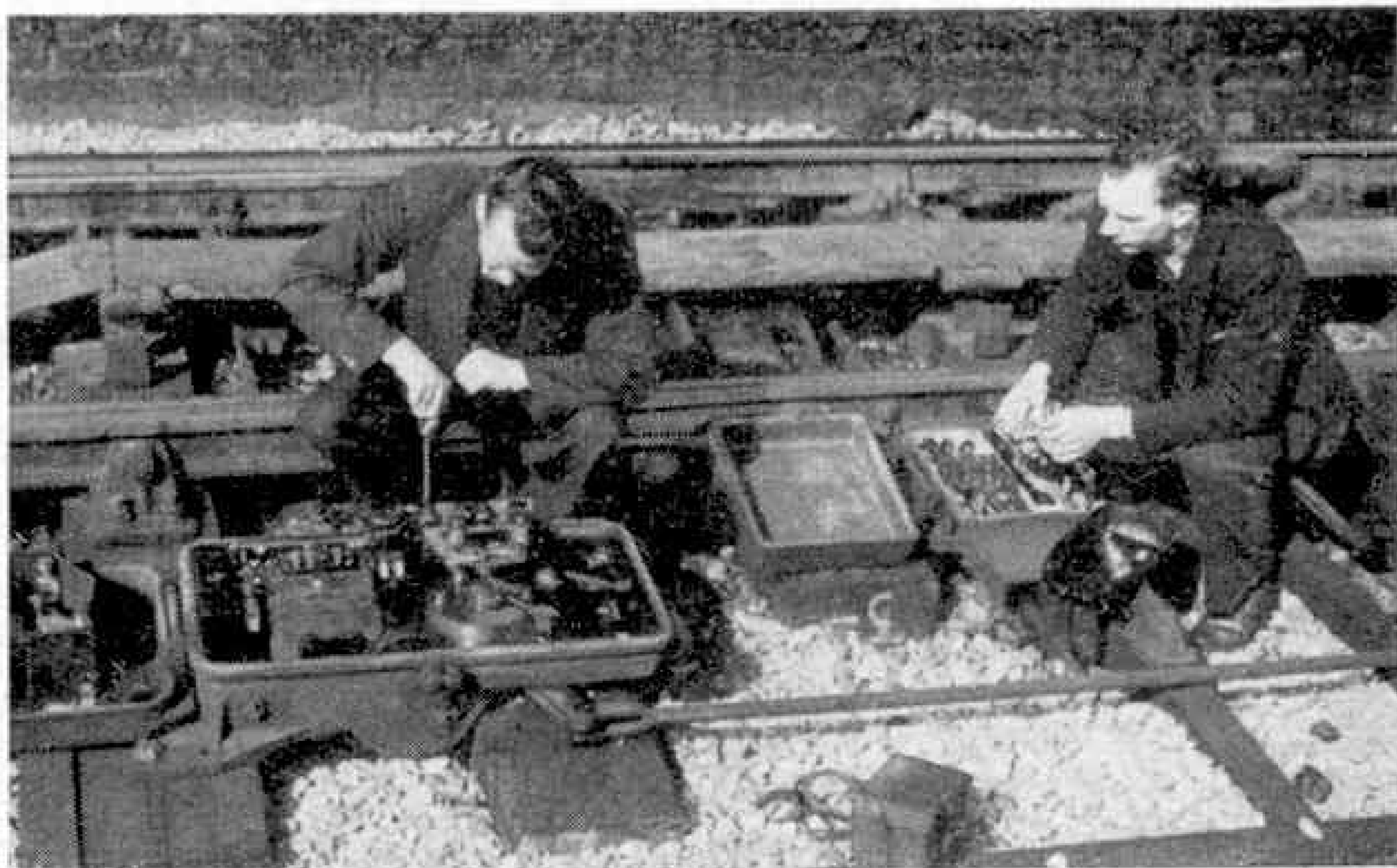
Express Travel in New Zealand

The attractive Dominion of New Zealand consists in the main of the North and South Islands, each possessing Government Railway systems laid to the 3 ft. 6 in. gauge and necessarily operated as separate sections of the whole. Fine scenery, notable tunnels and engineering works are prominent features with severe gradients in places. The locomotives depicted in the lower illustration on this page were intended to haul a principal express operating between Invercargill via Dunedin to Christchurch, and thence on to the port for that city at Lyttelton, where it terminates on the Wharf beside the steamer leaving every night for the North Island. A total distance of about 376 miles.

Mr. Brighton tells us that the journey time is over 12 hrs. including 19 stops, and motive power employed on the way includes one or two JA steam 4-6-4s responsible for 291 miles, a diesel-electric engine used over the 78 miles to Oamaru from Dunedin, an electric one for the 7 miles from Christchurch to Lyttelton, traversing a long tunnel, and then diesel-mechanical haulage on to the Ferry Wharf. Speeds up to 70 m.p.h. are often attained, which is close to the maximum advisable with safety on 3 ft. 6 in. gauge.

An Array of S.R. London Termini

The Southern Region of British Railways presents quite a selection of important terminal stations within the central area. The one-time separate companies when owning the lines concerned built in several cases what they called "West End" as well as "City" termini, involving expensive viaduct construction with several bridges over the Thames. For example, the London, Chatham and Dover Railway constructed



The maintenance of points and signal equipment is an important part of railway work. Here are two maintenance men busy with points machines. Photograph by W. S. Garth.

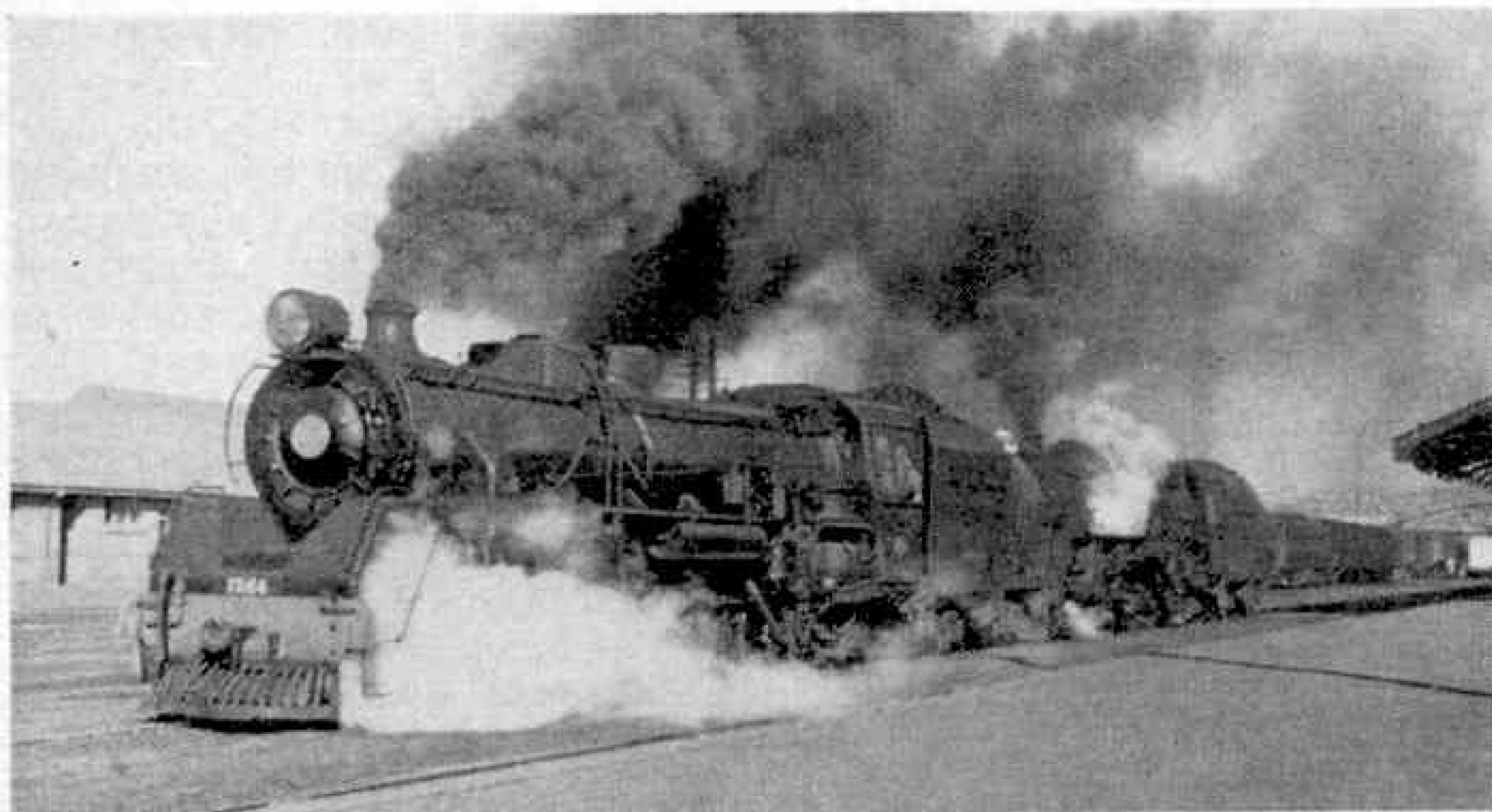
Victoria, jointly with some other interests, and Holborn Viaduct; the South Eastern Railway had Charing Cross and Cannon Street; and the London, Brighton and South Coast built Victoria and London Bridge.

The two large Victoria stations are side by side and are now operated as one. Much Continental traffic is handled there and it is the main starting point for the north Kent coast and Dover (Marine) trains, frequent electric services to the Sussex coast, and Portsmouth via Horsham, steam trains to the Oxted line and thence by secondary route to Brighton, etc. Charing Cross is the chief starting point during most of the day for the Folkestone-Dover steam trunk route and diesel-electric Hastings trains. During morning and evening business hours fast trains on the two latter services, as well as to and from Ramsgate via Chatham, use Cannon Street in the City of London, which at present is being partially rebuilt and modernised. It does not normally handle much midday traffic. Lines from it join the Charing Cross tracks close to London Bridge. Here there is a through higher level busy station on the Charing Cross or Cannon Street routes, joined to the "Brighton Line" larger terminus which is parallel and deals with a very large passenger volume.

Holborn Viaduct is a smaller chiefly suburban traffic station, catering also for mails, parcels and newspapers to and from further points in Kent during the night.

Waterloo, the largest and perhaps the most impressive of all in London, is the sole terminus at all hours for Western Division trains serving the Devon and Cornwall, Southampton-Bournemouth and Portsmouth main lines, the Windsor and Reading services via Staines, with much else intermediately. Without track connection, there are Waterloo (Eastern) platforms nearby on the Charing Cross line.

All these termini share in operating the most extensive network of surface electric suburban services and routes in the world—SOUTHERN ELECTRIC!



Two JA class 4-6-4s at Dunedin, N.Z., obviously eager to be off with the "South Island Limited Express," for which they are waiting. Photograph by L. B. Brighton.

Tunnels for Brussels Tramcars — — and High-Level Roads for Motor Traffic

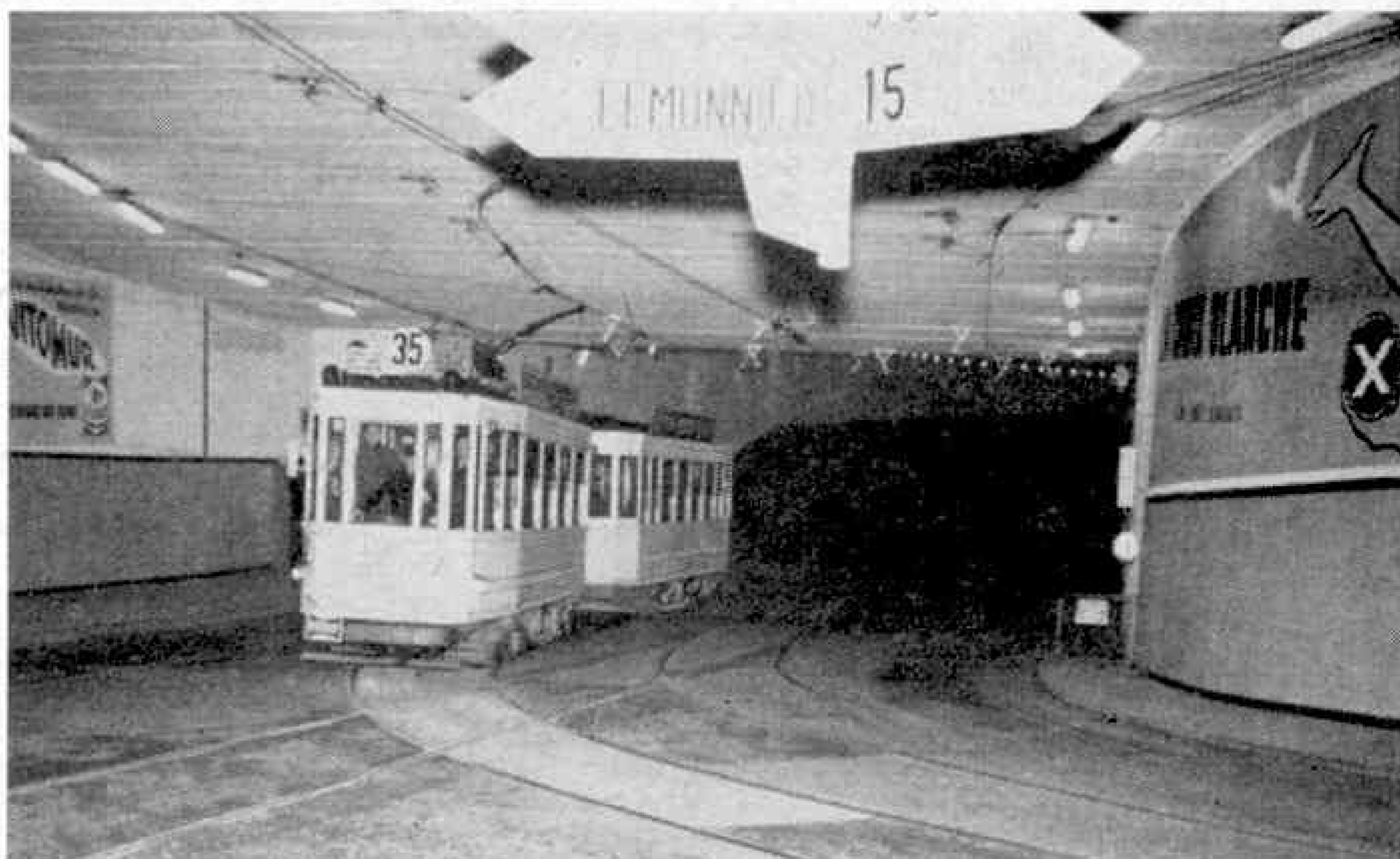
By J. W. Gahan

WE are living in an age when transport, of both goods and human beings, has attained the greatest possible importance, particularly in our large cities and towns. With the rapid growth of motor transport these are becoming almost choked to a standstill at busy times and remedial measures are now desperately urgent in many centres. Some cities have gone far towards solving the problems of traffic congestion, but others have yet to face them.

Last year attention was focused upon Brussels, the capital city of Belgium, in which was held the International and Universal Exhibition. This brought hundreds of thousands of people to the area. Like most large centres, Brussels already suffered severe traffic congestion, despite its many wide Boulevards and Avenues. It was realised that the influx of people and vehicles brought about by the Exhibition would add enormously to the traffic problems, and measures were put in hand to prevent any large scale chaos. Works were in hand indeed long before the Exhibition to improve conditions in the city, high-level roads and subways being under construction—and these were extended.

It is difficult for anybody who has not visited Brussels to realise the magnitude of these works, which involved both road and rail traffic. Since the end of World War II the two large main-line railway terminal stations have been replaced by new structures and a link between them has been constructed across the city by means of viaducts and tunnels and all the track has

been electrified. A new central station also has been built. In replacing the existing old stations by new ones, namely the Gare du Midi and Gare du Nord, road problems had to be solved also, as the new stations have not been built exactly on the sites of the old ones. These two new stations are among the finest in the world and are well worth a visit even if one is not travelling



Inside the main tunnels beneath the Place de la Constitution, one of the busiest spots in Brussels. The illustrations to this article are from photographs by Denis Gill, Hazel Grove, Cheshire.

by train. They are clean, spacious and most attractive in every way.

In the vicinity of the Gare du Midi there were numerous problems, as this station is situated near the Place de la Constitution, where several Avenues and Boulevards converge. In addition some of these thoroughfares included tramways that handled many thousands of passengers daily and had to carry out their operations without interruption. This meant the construction here of tunnels for the trams and high-level roads for motor traffic in other congested areas.

Public transport in the city and suburbs is mainly handled by tramways worked by two administrations, each having a different track gauge. The main city system is operated by La Societe des Transportes



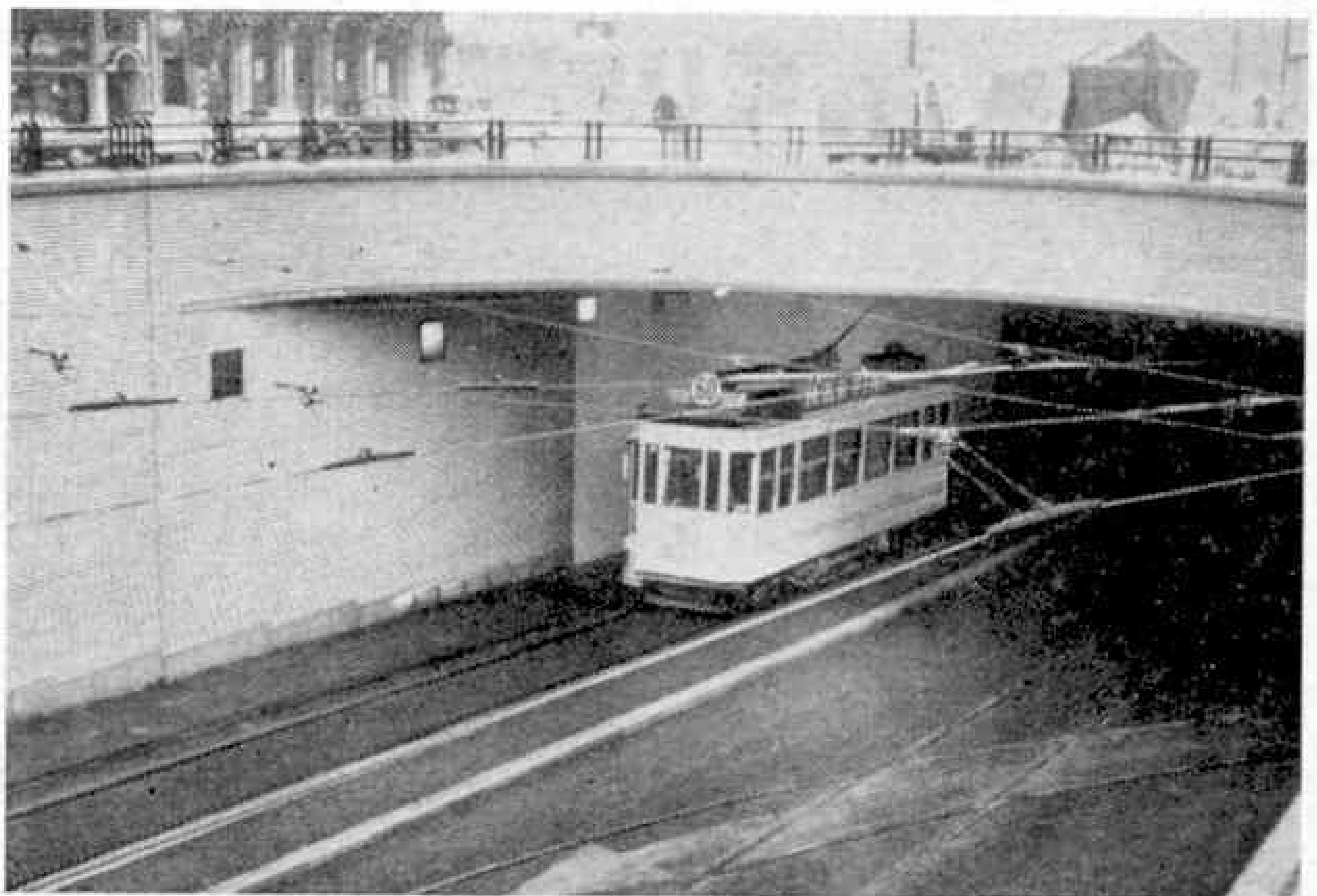
The entrance to the tramway tunnels in the Boulevard Lemonnier.

Intercommunaux de Bruxelles, which is responsible for a very large number of tram routes, one trolley-bus route and several motor bus services. The tramway system is laid to standard gauge and its services are extensive. The city is also penetrated in several areas by the national light railway system, the Societe Nationale des Chemins de fer Vicinaux. This is popularly known as the "Vicinal", and its track is laid to the gauge of one metre. At some places the same track is used by both systems, with a third rail for the narrow gauge, but an outer rail common to both.

The tunnel schemes include not only those for trams, but also others for motor vehicles at busy intersections. At the Place de la Constitution the tramways have been placed below ground, except for one route, and the area is now served by an underground station with four platforms reached by stairs and escalators and equipped with fluorescent lighting. Not only in the city centre have such subways been built, but also at busy intersections and in the vicinity of the Exhibition site. Thus at former congested places public transport is kept separate from private cars and commercial vehicles, with consequent benefit to both.

Construction of the subways has been carried out by the cut and cover method. In this the ground is excavated to the required depth and width, and is then roofed over and a new road surface is provided. Considerable difficulties were experienced due to the presence of sewers, electric cables and the foundations of buildings. All these have been overcome. The tunnels are formed of steel girders and concrete, and they are illuminated throughout by sodium lighting. Narrow footways are provided in parts for passengers to walk along in safety. Electric cables and sewers have been laid between the roof of the tunnel and the road surface.

Can motorways and tramways be reconciled? The answer appears to be in the affirmative. The retention of the heaviest loaded tramway routes is considered essential and every effort has been made



A standard tramcar emerging from the Boulevard Jamar Tram Tunnel, in the centre of Brussels.

to include reserved tracks where possible and to ensure absolute efficiency. A fleet of high speed trams has been built and these sleek and speedy vehicles include every possible refinement. They run on

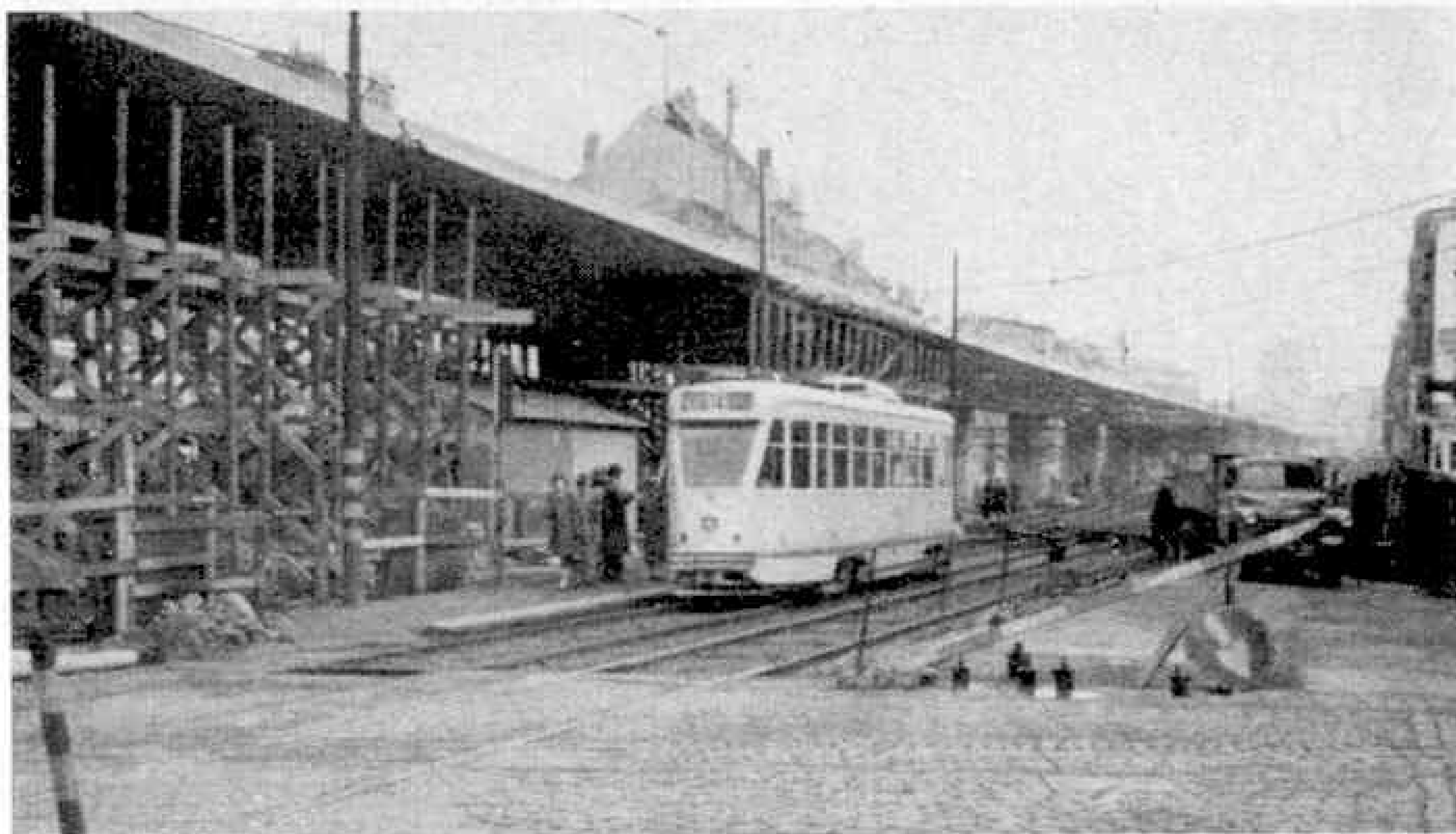
bogies of the American PCC type, with noise-proof resilient wheels, and in their swift acceleration and capacity for rapid loading and unloading at stops, they are in great contrast to any trams ever used in Britain.

It may be wondered why buses have not been considered and run in subways instead of trams. There are several reasons for this. Tunnels for buses would have to be wider in order to allow the vehicles to pass each other safely and this would increase the cost of construction. There would also be the necessity for costly ventilating plant to remove the exhaust fumes.

The high carrying capacity of trams is another factor, as this keeps down the number of vehicles required, a vital consideration in a city with congestion problems.

The trend today is towards the construction of underground railways in large cities with mass transport troubles, but in Brussels, where a full scale system similar to that of London or New York would not be justified, the sub-surface

tramway linked up with surface reserved tracks provides similar facilities at reduced cost. Other subways are planned, including one following the full length of Boulevard Lemonnier, a busy shop-lined thoroughfare,

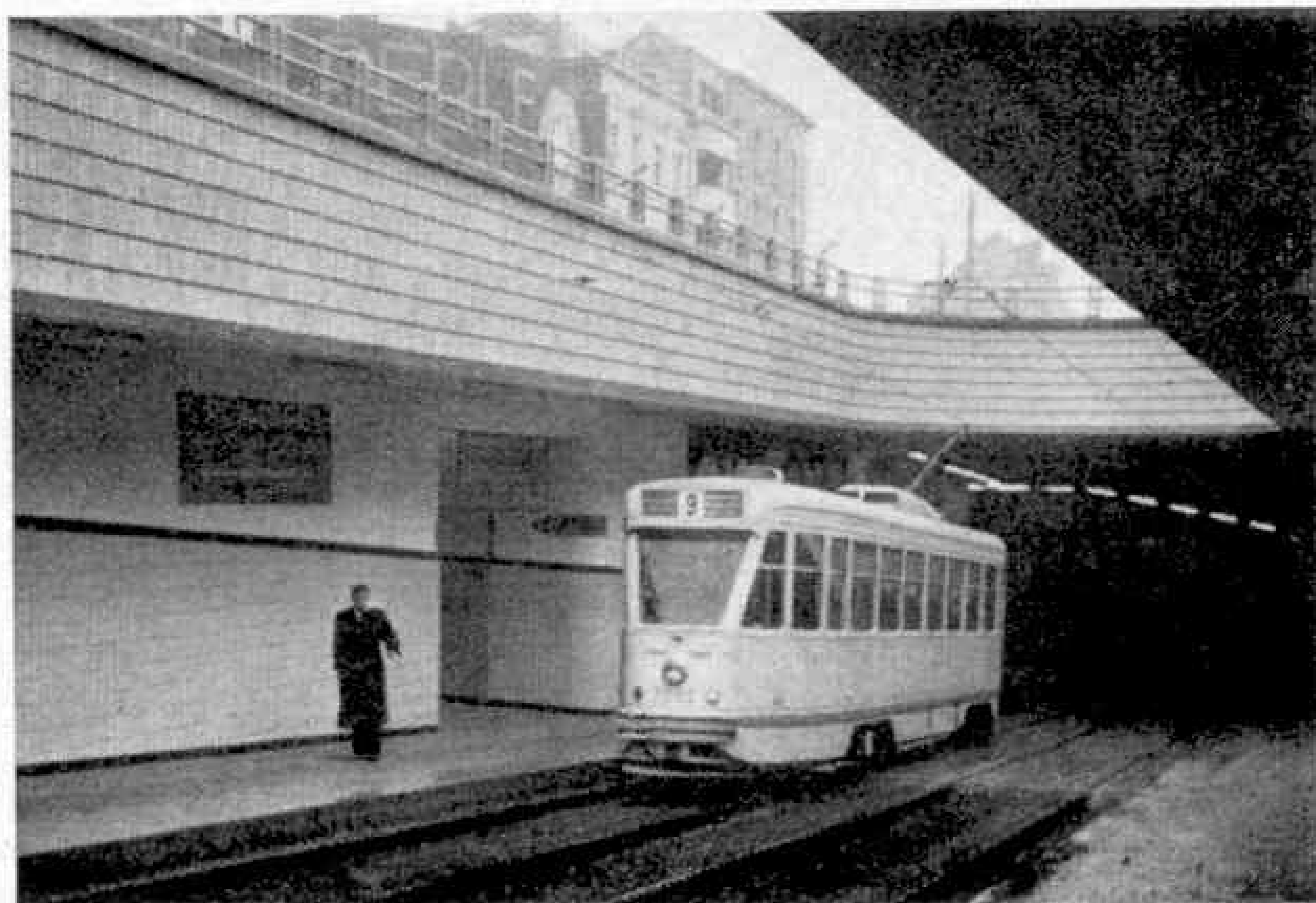


Viaduct under construction on Rue Baudouin, one of the main routes through Brussels. A PCC Tramcar passing part of the works.

the track of which will be extended into disused canal tunnels beneath the Boulevard. When this is finished it will be possible for the surface to be given over entirely to motor vehicles, while tram passengers will travel uninterrupted at high speed below street level.

Where streets are heavily congested new wide motor roads are being built permitting an easier flow of traffic. A mile long three-lane high-level motorway has already been built with the old road and tramway below, linking up with a ring road, while other wide avenues have been converted to motorways also.

These works have earned the praise of all who have seen what has been done so far in order to remove one of the greatest transport headaches of the present day. The example of Brussels may well be followed by other cities with similar problems, but in some ways it is to be regretted that once charming avenues must become vast areas of concrete.



A PCC type Tramcar emerging into the Boulevard Poincare from the tunnels under the Place de la Constitution.

"Birds and Beasts" Model-Building Competition

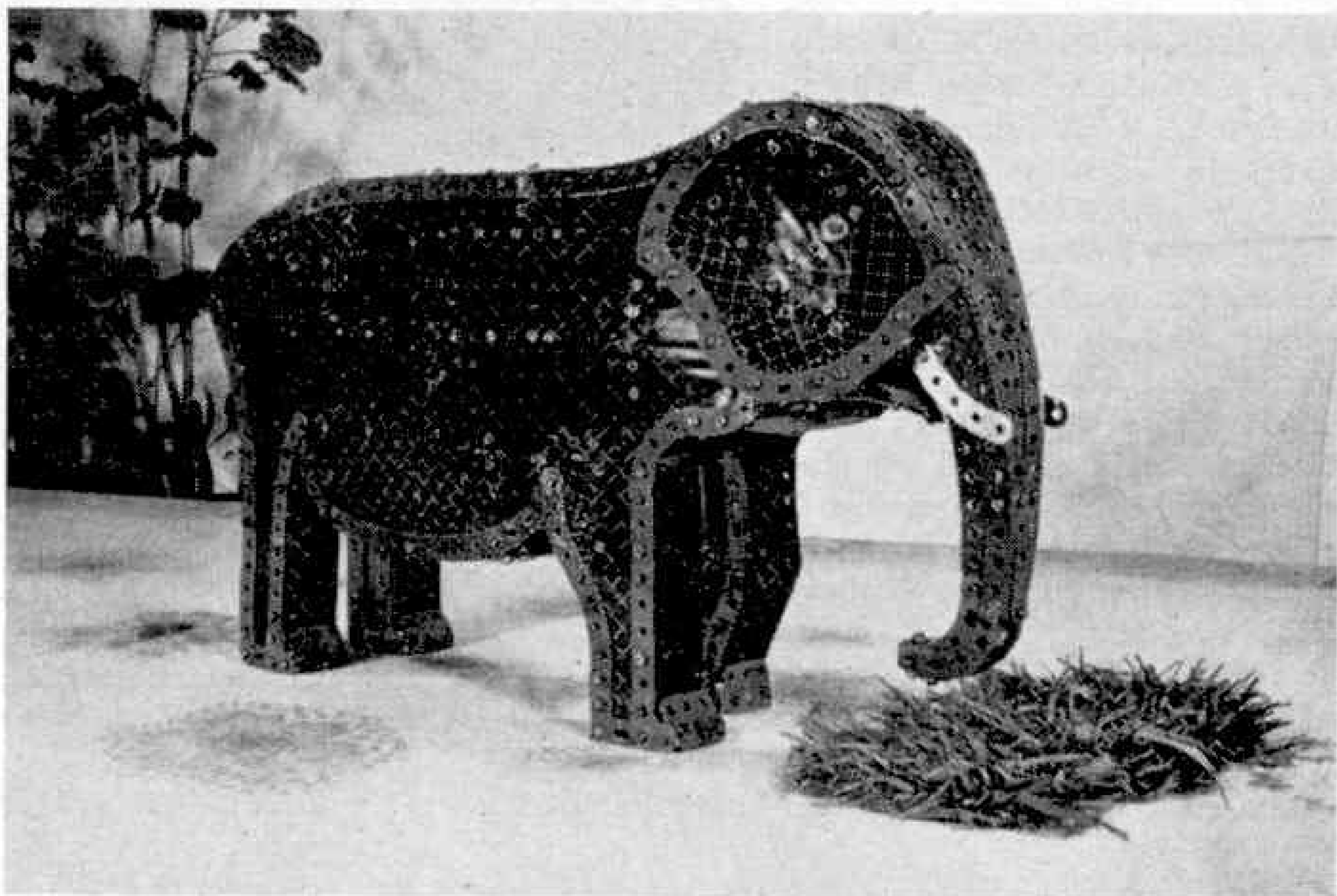
REMARKABLY life-like models of birds and animals can be constructed from Meccano parts, as the amusing example of an Elephant shown on this page demonstrates. This model won a prize in a previous *Birds and Beasts* Competition. A particularly useful feature in building models of this kind is that remarkable realism can be achieved using very few parts. A model of this type can be built up in quite a short time and the pastime is therefore just the thing for short spells indoors during the spring and summer months. Then most of us like to spend as much time as possible out in the open air, but rain does sometimes interrupt our normal outdoor pastimes.

It is to provide an interesting and amusing occupation for the model-builder during these spells that this Contest has been arranged. In order to take part in it competitors should make models of any birds, beasts, fish or any other creature they like, and then obtain either photographs or good sketches of them. Neither photographs nor drawings need be the competitors' own work.

Competitors may build their models either solid, that is in three dimensions, or in the flat. The Meccano parts used may be of any type or quantity, and a

competitor may submit two or more models provided that all the entries are sent in the same envelope. And don't forget—strive for simplicity rather than try to build an elaborate model, and introduce a comic note if you can.

The Contest will be divided into two Sections: A, for model-builders under 12 years of age on 31st July next, and B, for



This realistic model elephant won a First Prize in a previous "Birds and Beasts" Competition. It was built by G. Giese, Buenos Aires.

those who will be 12 or over on 31st July next. The prizes to be awarded in each Section are shown below.

Each competitor must write his name and full address on the back of each photograph or drawing sent in, with his age on the closing date. Entries must be addressed to "*Birds and Beasts Model-Building Competition, Meccano Limited, Binns Road, Liverpool 13*", and must be received on or before 31st July next.

We would like to remind readers that they should make quite sure that these requirements are fulfilled, as such omissions as the sender's name or address have sometimes meant that a very promising entry has had to be disregarded.

All prize-winners will be notified by letter, and illustrations of some of the principal prize models may be included in a future issue of the Magazine.

THE PRIZES

The following prizes will be awarded in each of the Sections A and B.

	£	s.	d.
First Prize, Cheque for	4	4	0
Second Prize, Cheque for	2	2	0
Third Prize, Cheque for	1	1	0
Ten prizes, each of	10	0	
Ten prizes, each of	5	0	

Among the Model-Builders

By "Spanner"

Compact Reversing Gear-Box

Shown in the drawing reproduced as Fig. 1 is a compact reversing gear-box designed by Colin Cohen, Cape Town, S. Africa.

The housing for the mechanism consists of two 2" Perforated Strips, which are held apart by two 2" Screwed Rods at a distance of approximately $1\frac{1}{4}$ ". The input and output shafts are arranged in line with each other and each carries a $\frac{1}{2}$ " Pinion 2 and 3. The input shaft projects halfway into the Pinion 2 carried on the output shaft. The Pinion 2 is spaced from the housing by a Washer and the Pinion 3 by two Washers.

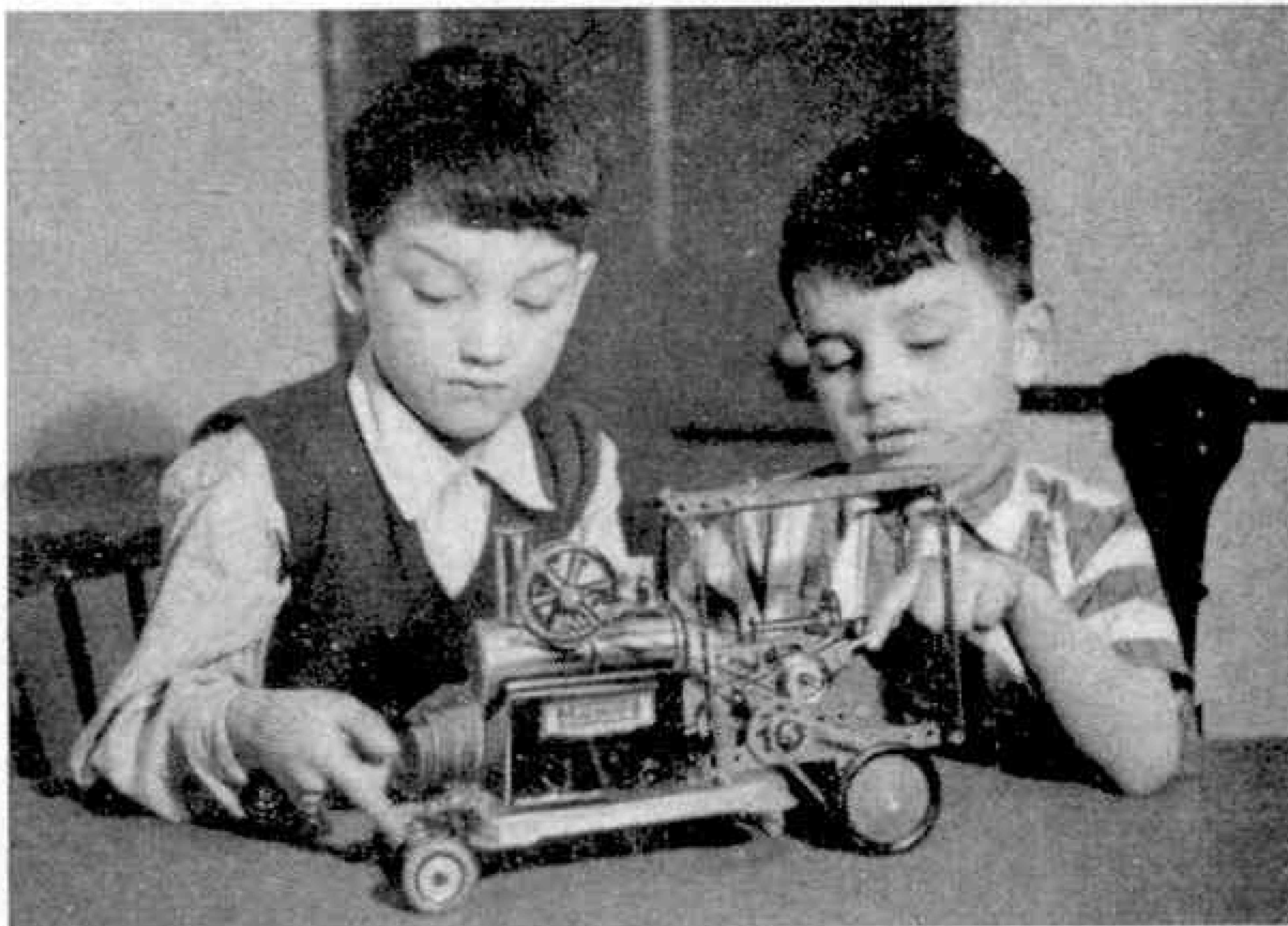
The layshaft 1 is placed alongside the input and output shafts in the 2" Strips and it carries two $\frac{1}{2}$ " Pinions arranged as shown. On the input side of the shaft three Washers

are placed between the Pinion and the housing, and on the other side there is one Washer.

The selector shaft is arranged above the other two shafts and is supported by two 1" Triangular Plates, which are positioned in such a way that two of their

holes are situated on the shafts carried in the 2" Perforated Strips, between the Perforated Strips and the Washers carried on the shafts. In the third hole is carried the selector shaft. On this shaft are a $\frac{1}{2}$ " Pinion 4, two Collars and five Washers arranged as shown. The Pinion 4 is placed so that when the selector shaft is moved to the left it engages both Pinions 2 and 3, and when the selector is moved to the right, Pinion 3 and one of the Pinions on the layshaft 1.

The selector lever is a $1\frac{1}{2}$ " Perforated



Ralph and Henry Gomes, the two young sons of Mr. L. B. Gomes, East Croydon, are keenly interested in Meccano and are here seen with a model steam-driven traction engine built for them by their father. Mr. Gomes was also a Meccano enthusiast in his young days.

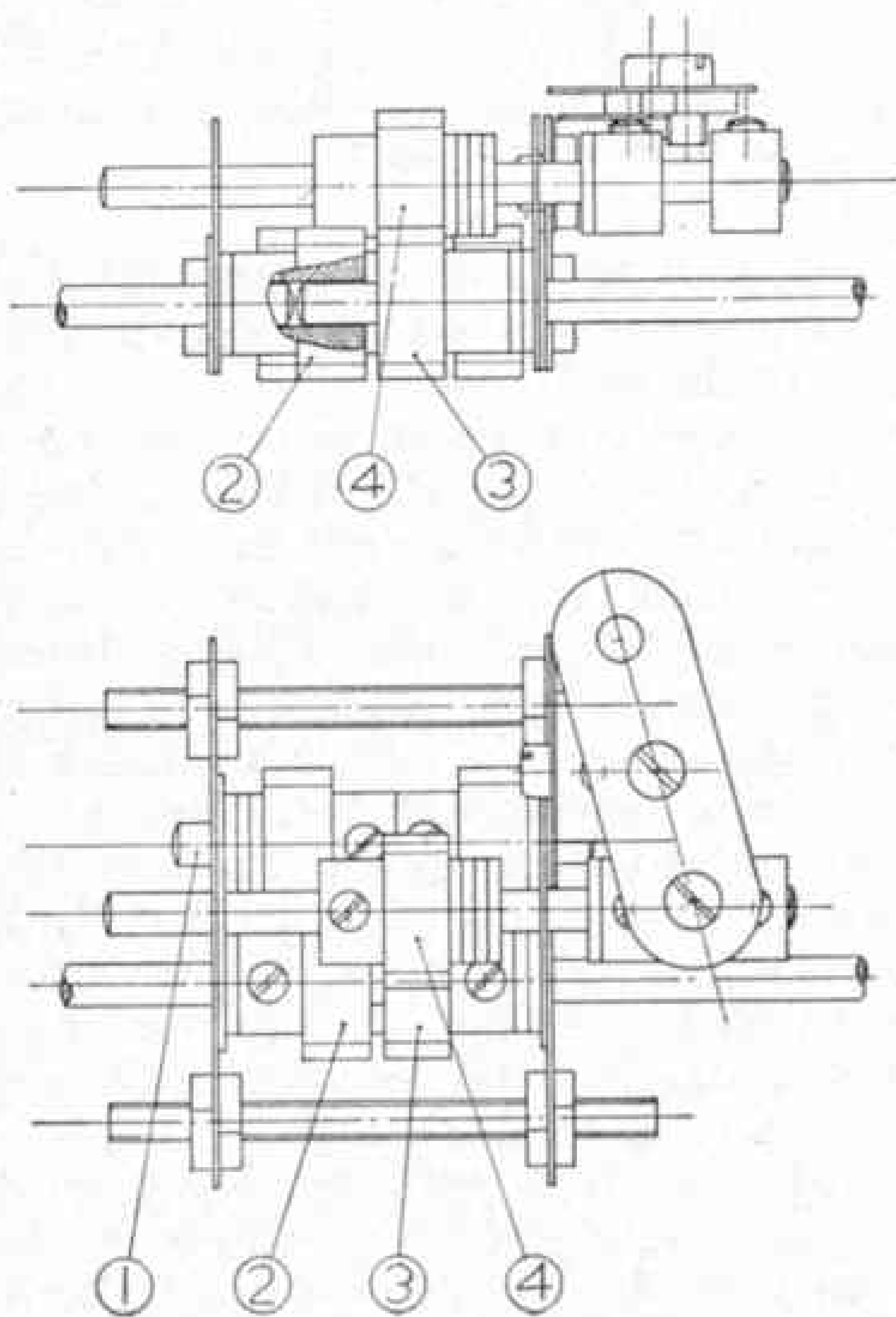


Fig. 1. A reversing gear-box designed and drawn by C. Cohen, Cape Town, S. Africa. It is described on this page.



From India comes this photograph of the six-year-old son of Mr. K. Thirumaleshwer, Nampally, Hyderabad, busy at work on a Meccano model.

Strip, which is held in place in the following manner. A 1" Triangular Plate is mounted on the shaft 1 and the adjacent Screwed Rod, and carries an Angle Bracket by a Bolt passed through the round hole of the latter. The selector lever is pivoted on a Bolt that is lock-nutted in the free hole in the Angle Bracket. Fixed in the lever is a Bolt, the shank of which engages between the two Collars on the selector shaft.

It should be noted that the standard Grub Screws in all the Pinions must be replaced by 7/64" Grub Screws (Part No. 69c) and that in the drawing of the side view of the mechanism the near Screwed Rod and nuts have been omitted.

Double Reduction Rear Axle for Heavy Duty

A 15-tooth Pinion is put to good use in the double reduction rear axle drive unit that is shown in Fig. 2. This mechanism is specially intended for use in heavy duty motor vehicles and

is arranged as follows. A $\frac{1}{2}$ " Pinion 1 and a Bush Wheel 2 are mounted on the outer end of the half-shaft, and it should be noted that the Bush Wheel is free on the shaft while the Pinion is fixed to it. A $\frac{1}{2}$ " Bolt 3 locked in the Bush Wheel carries a loose 15-tooth Pinion 4, which engages the teeth of a $1\frac{1}{2}$ " diam. Contrate 5. The Contrate is *free* on the end of the half-shaft. The road wheel, represented by a 3" Pulley 6, carries two $\frac{1}{2}$ " Bolts 7 and 8, which project into holes in the Contrate as shown, and the Pulley itself is *free* on the shaft.

The Bush Wheel 2 is connected by two $2\frac{1}{2} \times \frac{1}{2}$ " Double Angle Strips to a Boiler End that forms part of the differential casing, and the drive from the differential to the half-shaft is taken by a further $1\frac{1}{2}$ " Contrate 9.

An Adjustable Cam

An easily adjustable cam can be made up with a Bush Wheel to which a Pawl is bolted with its boss outermost. The extent of the cam movement can be varied by adjusting the angle of the Pawl in relation to the Bush Wheel.

Cams are used for a large number of purposes in Meccano model-building, almost any design being possible with the aid of remarkably few parts. Tappet rods for use with the cams may consist simply of the edge of a Strip or a small roller carried at one end of a Rod or Strip.

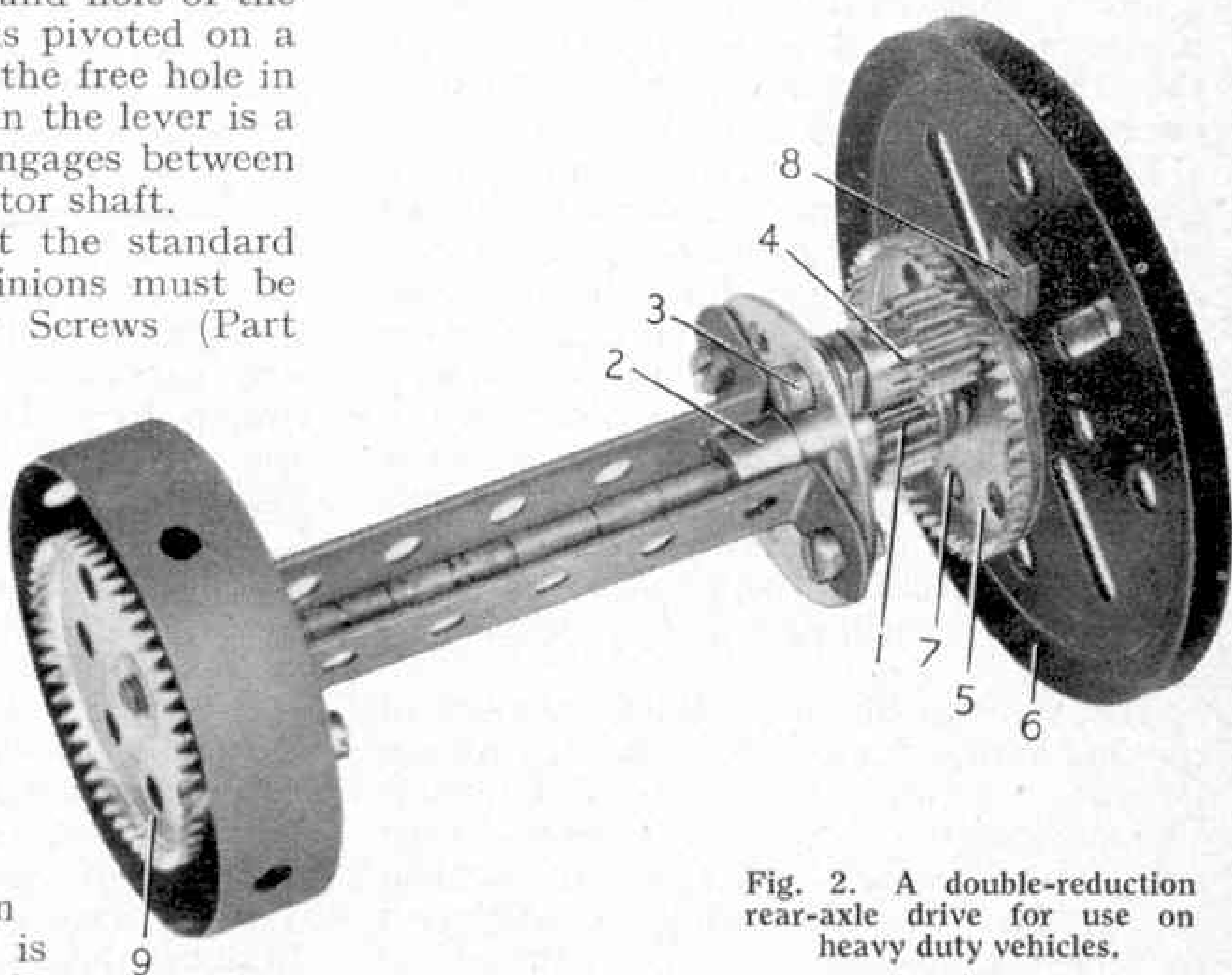
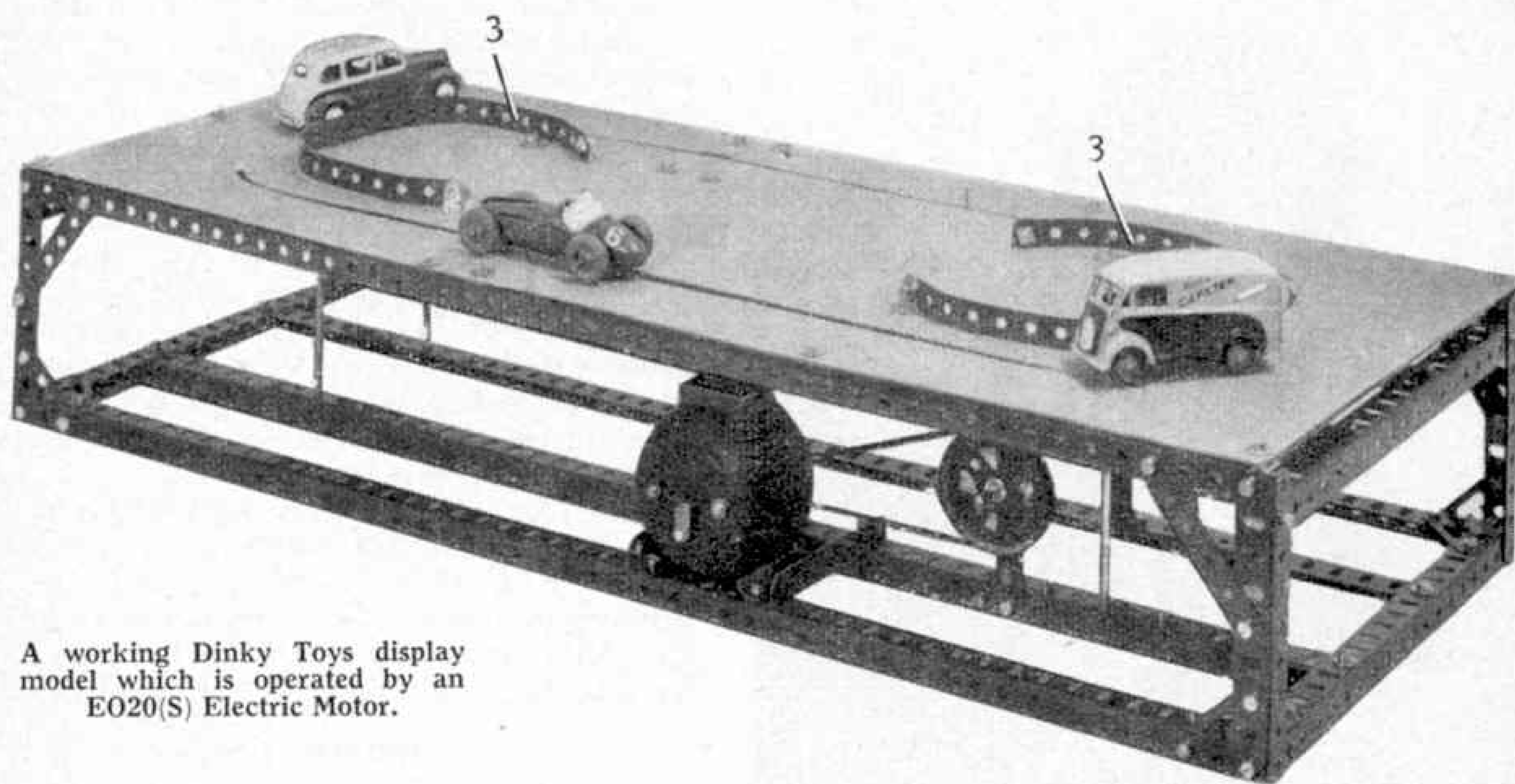


Fig. 2. A double-reduction rear-axle drive for use on heavy duty vehicles.



A working Dinky Toys display model which is operated by an EO20(S) Electric Motor.

A Working Dinky Toys Display

A Novel Mechanism for Enthusiasts

A DISPLAY of Dinky Toys and Dinky Supertoys is always an attraction, and when it is a working display it is sure to draw a crowd of interested spectators. For some time now special displays of moving Dinky Toys have been available to Meccano dealers, and these displays have aroused considerable interest. Meccano model-builders will be interested to learn that the basic mechanisms of the displays are made with Meccano parts.

We have received many enquiries from Dinky Toys collectors for details of these moving displays. For various reasons, one of which is that the need for operating them continuously and for long periods involves the use of a high voltage motor, the precise design of the dealers' display is not readily adaptable for home construction, but it is possible to arrange a similar display with Meccano parts and a few additional items that can be obtained very easily, and most model-builders will find it very interesting to do this.

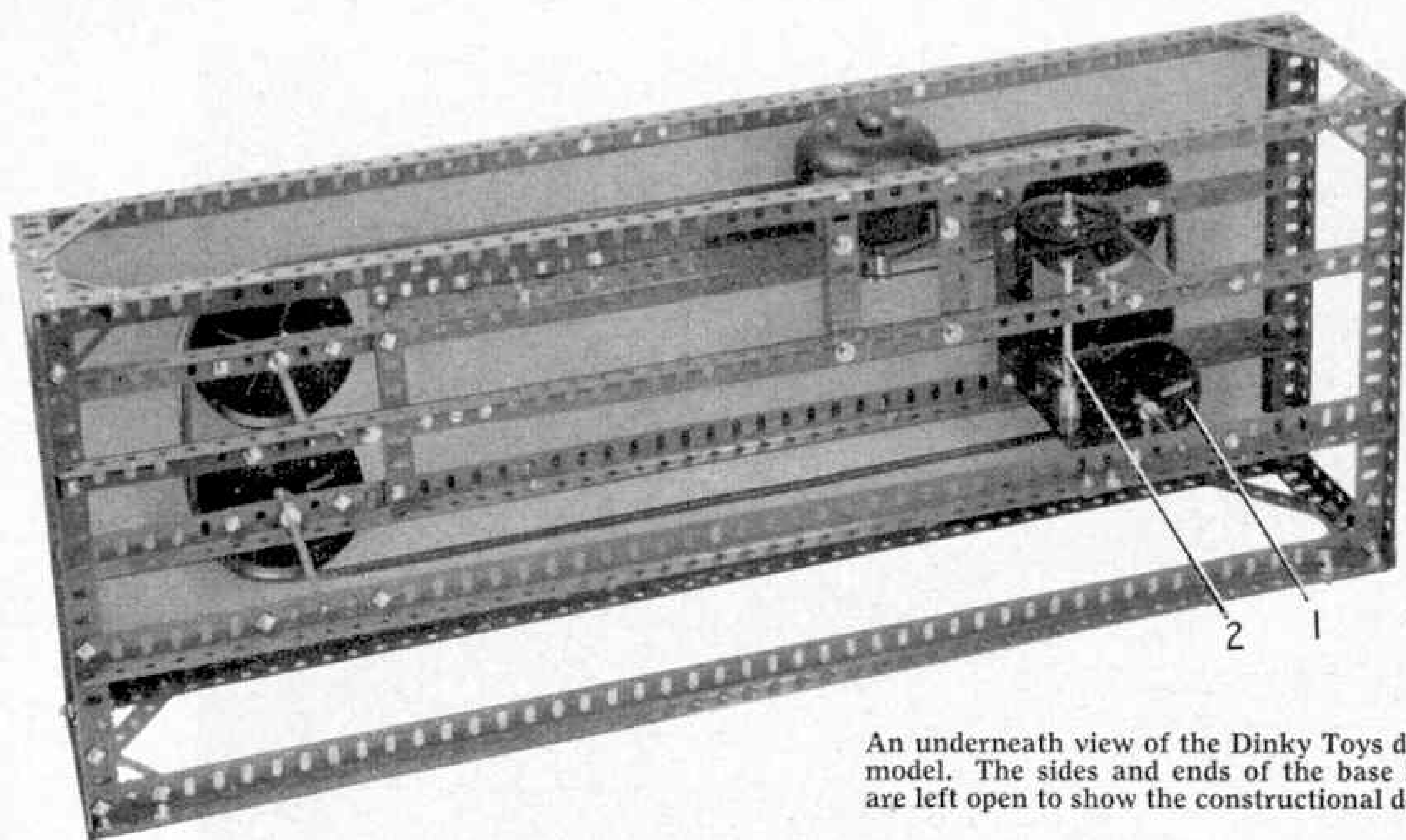
The mechanism of a simple display of moving Dinky Toys is shown in the pictures on this and the facing page. To show the construction clearly, the sides and ends are shown left open, but they can be filled in very easily with Meccano parts, cardboard or plywood, which can be lettered or decorated to the constructor's taste.

The main framework of the mechanism

is a stout structure made from Angle Girders. In the example illustrated the sides are made with $24\frac{1}{2}$ " and $4\frac{1}{2}$ " Angle Girders, and the ends are formed by $9\frac{1}{2}$ " Angle Girders.

The Dinky Toys are carried along by an endless belt passed round four 3" Pulleys. Each of these Pulleys is fixed on the upper end of a Rod mounted in $24\frac{1}{2}$ " Angle Girders bolted between the $9\frac{1}{2}$ " Angle Girders forming the ends of the framework. Strips are bolted to the Girders to locate the Rods in the slotted holes, and one of the Rods carries a $2\frac{1}{2}$ " Gear marked 1. The Gear is driven by a Worm Gear on a Rod 2, which is mounted in Strips bolted to the framework and carries a 2" Pulley. The Pulley is driven by a Driving Band passed round the pulley of an EO20(S) Electric Motor bolted to $3\frac{1}{2}$ " Angle Girders.

The endless belt is a piece of round leather belting of the kind fitted to sewing machines, and it can be obtained from shops dealing in spare parts for these machines. The belt is cut to length and its ends joined so that it is a tight fit round the 3" Pulleys. Up to six steel pins are pushed through the belt, so that they engage in small holes drilled in the base plates of the Dinky Toys. The platform supporting the models is cut from cardboard or plywood, and the slot in it must be arranged to allow the steel pins to slide freely along the slot. The slot must



An underneath view of the Dinky Toys display model. The sides and ends of the base frame are left open to show the constructional details.

be cut accurately, otherwise it may move the pins out of line and force the belt off the Pulleys. The centre section of the supporting platform is bolted to $12\frac{1}{2}$ " Angle Girders, which are connected to two of the $24\frac{1}{2}$ " Angle Girders by $12\frac{1}{2}$ " Flat Girders. A $12\frac{1}{2}$ " Strip 3 curved as shown is attached to each end of the platform to guide the models round the curves.

The following is a list of the Meccano

parts required to build the mechanism: 2 of No. 1; 2 of No. 1a; 2 of No. 3; 4 of No. 4; 8 of No. 5; 8 of No. 7; 2 of No. 8; 4 of No. 8a; 4 of No. 9a; 4 of No. 9b; 4 of No. 12; 1 of No. 15; 4 of No. 15b; 4 of No. 19b; 1 of No. 20a; 1 of No. 27c; 1 of No. 32; 116 of No. 37a; 106 of No. 37b; 48 of No. 38; 5 of No. 59; 2 of No. 103b; 10 of No. 111c; 8 of No. 133; 2 of No. 133a; 1 of No. 186b; 1 EO20(S) Electric Motor.

"ROCKETS AND SATELLITES WORK LIKE THIS"

By JOHN W. R. TAYLOR

(Phoenix House Ltd., 9/6 net)

Nowadays rockets and space journeys dominate the thoughts of most boys, and indeed of many grown-up people. And no wonder, for what could be more fascinating than the prospect of a journey into space, even if it is only to take one as far as the Moon!

But this should not be left as mere fancy, certainly not to readers of the *M.M.*, who will welcome Mr. Taylor's book for the story it has to tell and the splendidly clear way in which it is recounted. Mr. Taylor of course is well-known to them and they are assured that what he has to say about space flight is certainly worth reading. I like particularly his last paragraph: "A Soviet scientist has said that somewhere in Russia there lives today the boy who will one day be the first man to walk on the Moon. He may be wrong. The boy may live in Britain or America. In fact, he might even be you."

But let us look at the book itself. It begins with a brief picture of the scene when a space rocket is launched, conveying the intensity of the moments of silence during the count down that precedes the slow beginning of the ascent of the rocket, when the ground trembles with the power of the roaring engines. Next the author turns to the things that make a rocket work, and here he has explained in very simple terms, but quite adequately, just what rockets are and what they do, following this up with the history of rockets from early days in China and India down to the present day. There are sections dealing with fuels and performance, and with the wonderful guidance systems that are incorporated, and on the

success of which depends the achievement of the aims of the rocket firers and space explorers.

Missiles of course also come into the picture, and the later pages of the book are taken up with man in space, telling the stories of the successful satellites and space rockets already launched, and explaining something of the plans that are now being made that may lead eventually to the achievement foreshadowed in the quotation I have given above.

The book has 60 illustrations, all of them very informative.

* * * *

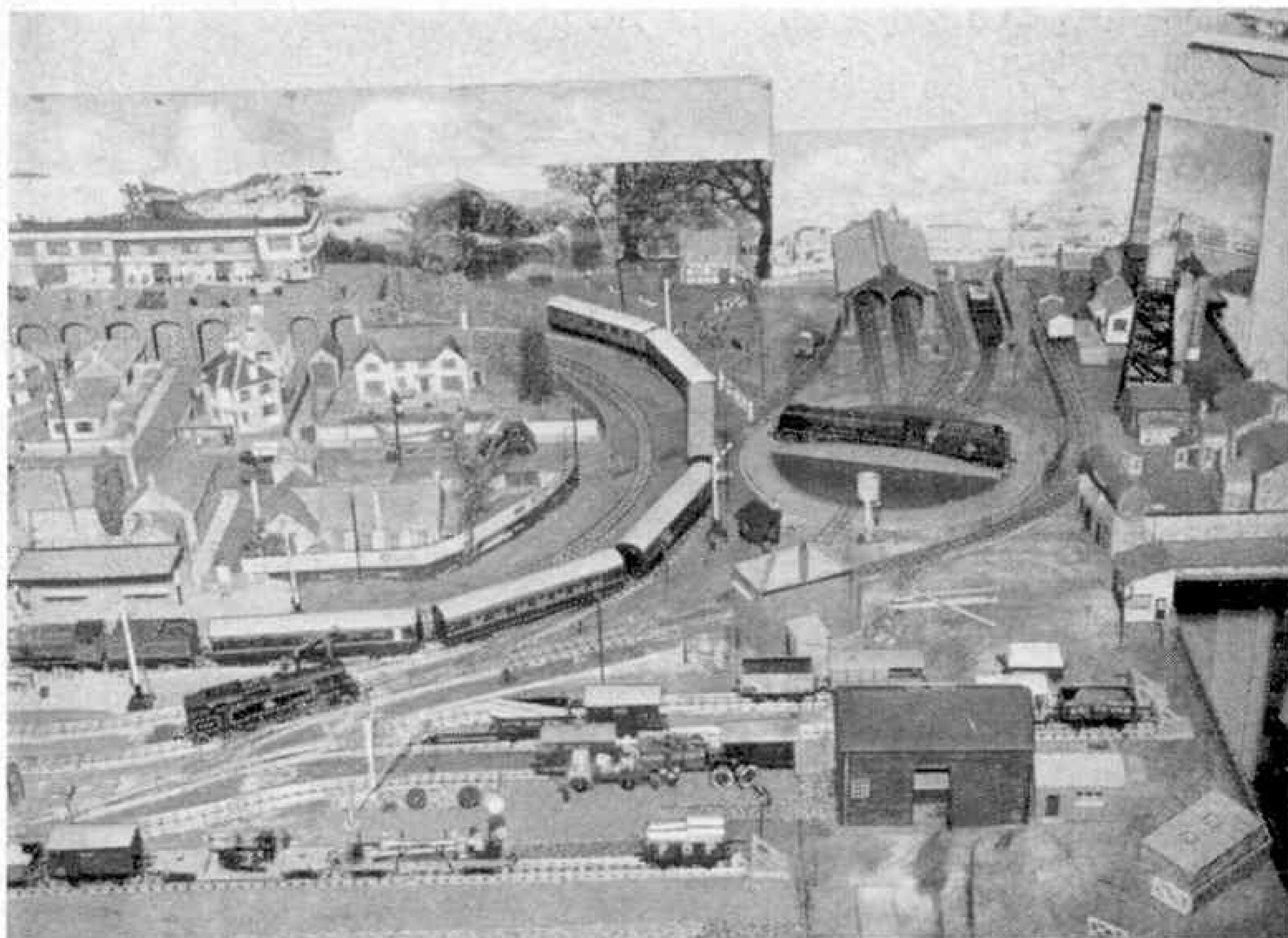
"THE OBSERVER'S BOOK OF SEA FISHES"

By A. LAURENCE WELLS

(Warne, price 5/-)

What is there more obviously attractive than poking about the shallows and rock pools of our coasts, or fishing in somewhat deeper sea waters, during a fine summer holiday? The pleasure is greatly increased when we learn something about the fishes themselves. This can be done by those interested by making use of this addition to *The Observer's Book* series of pocket handbooks, which describes and pictures the fish likely to be found. Actually it deals with 164 species of salt-water fish, of which 118 are illustrated in colour or in black and white.

There is also a classified index to orders, families, genera and species, which gives the right naturalistic air. The individual notes on the different types refer to distinctive features and gives details of colour and other helps to recognition, such as the locations where each fish is most common. There is a good general index at the end of the book.



Part of the Hornby-Dublo layout of Mr. D. Findlater, and his son, showing the remarkable degree of lineside development.

HORNBY RAILWAY COMPANY

By the Secretary

About Two-Rail

I KNOW that many of you who saw the advertisement in last month's *M.M.* relating to the introduction of a two-rail system in Hornby-Dublo are expecting me to say something on this subject. I have had a great deal of correspondence regarding two-rail since the introduction of this system was first made known, so that it will be useful if I deal with one or two of the points that have been raised.

In the first place it is important to note that the introduction of two-rail in Hornby-Dublo does *not* mean that the familiar and popular three-rail system that we have had for so long is being abandoned. This I hope will reassure owners of existing Hornby-Dublo layouts. They will be able to carry on with their development schemes as usual. Briefly, the position regarding three-rail is that Locomotives and the standard three-rail track will continue in production, but there will be no further Train Sets in three-rail. With the provision of moulded wheels on all Hornby-Dublo rolling stock, the vehicles become suitable either for three-rail or two-rail operation.

Some Hornby-Dublo owners will undoubtedly wish to change to the new

system. Most will realise straight away that there is no question of the possibility of converting existing Hornby-Dublo three-rail track for two-rail running. The two types of track are not interchangeable in any way, and neither two-rail nor three-rail locomotives will run on each others' track. I mention this specially because some of my younger friends appear to be in some doubt about this.

Regarding the possibility of conversion of Hornby-Dublo three-rail locomotives for two-rail operation, there is no scheme yet in hand for this. The pressure involved in the Meccano Works in carrying out the production programme for this year will make such arrangements impossible for the time being, but I do hope that something of the kind may be put into operation during 1960.

Practical details of the two-rail system are to be dealt with in these pages in due course, while I am naturally looking forward to telling you about the various new items that are to come along this year, when they appear.

A layout that is typical of the stage of development reached by many Hornby-

Dublo three-rail owners is shown at the head of the previous page. This is the fine system built up by Mr. D. Findlater, of Nairn, for his son. It has been dealt with before in the *M.M.* at a much earlier state of development. The railway is not merely good to look at, with its realistic

As on many layouts nowadays, there is a built-up scenic section forming a tunnel over the main lines on the side of the layout that is away from the operator. The tunnel entrances are not very obtrusive and advantage is taken of this in operating. When the trains leave the station they do

not immediately set off on a continuous series of circuits. They are held in the tunnel until they are required to re-appear and this gives the impression of distance to their journeys. While they are thus "out of section" shunting work in and about the station and yard can be performed in a really pleasing manner.

The other layouts shown here will be of interest in view of our talk last month on display systems. In the picture above you can see (almost) three Hornby-Dublo



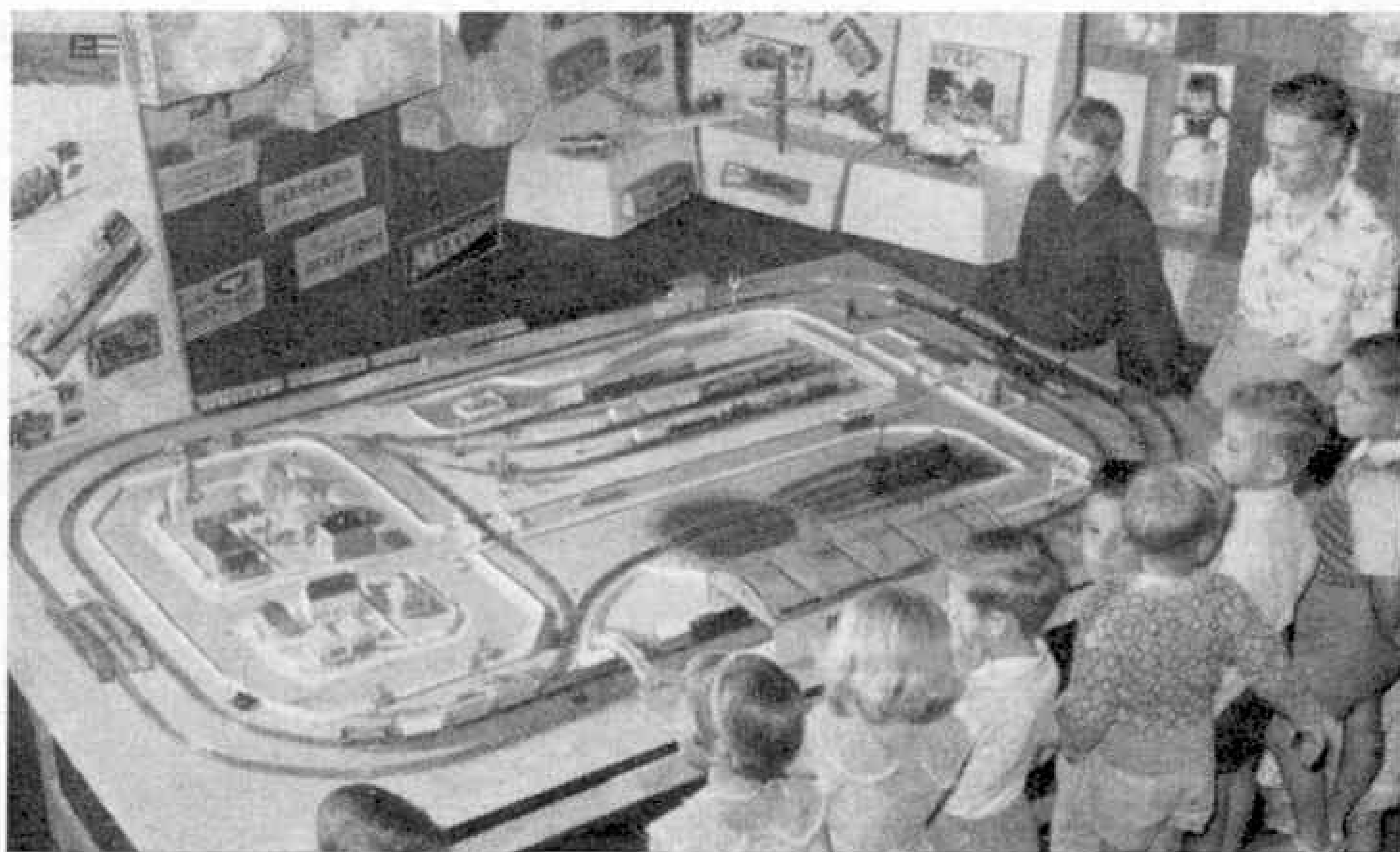
A Hornby-Dublo layout arranged for display purposes by the enthusiasts whom you see in this picture. They are, right to left, John Chapman, Donald Halliday, and (partly) Angus Byrne.

arrangement of the track, and of the lineside township and countryside features provided; it is a good system for running as well.

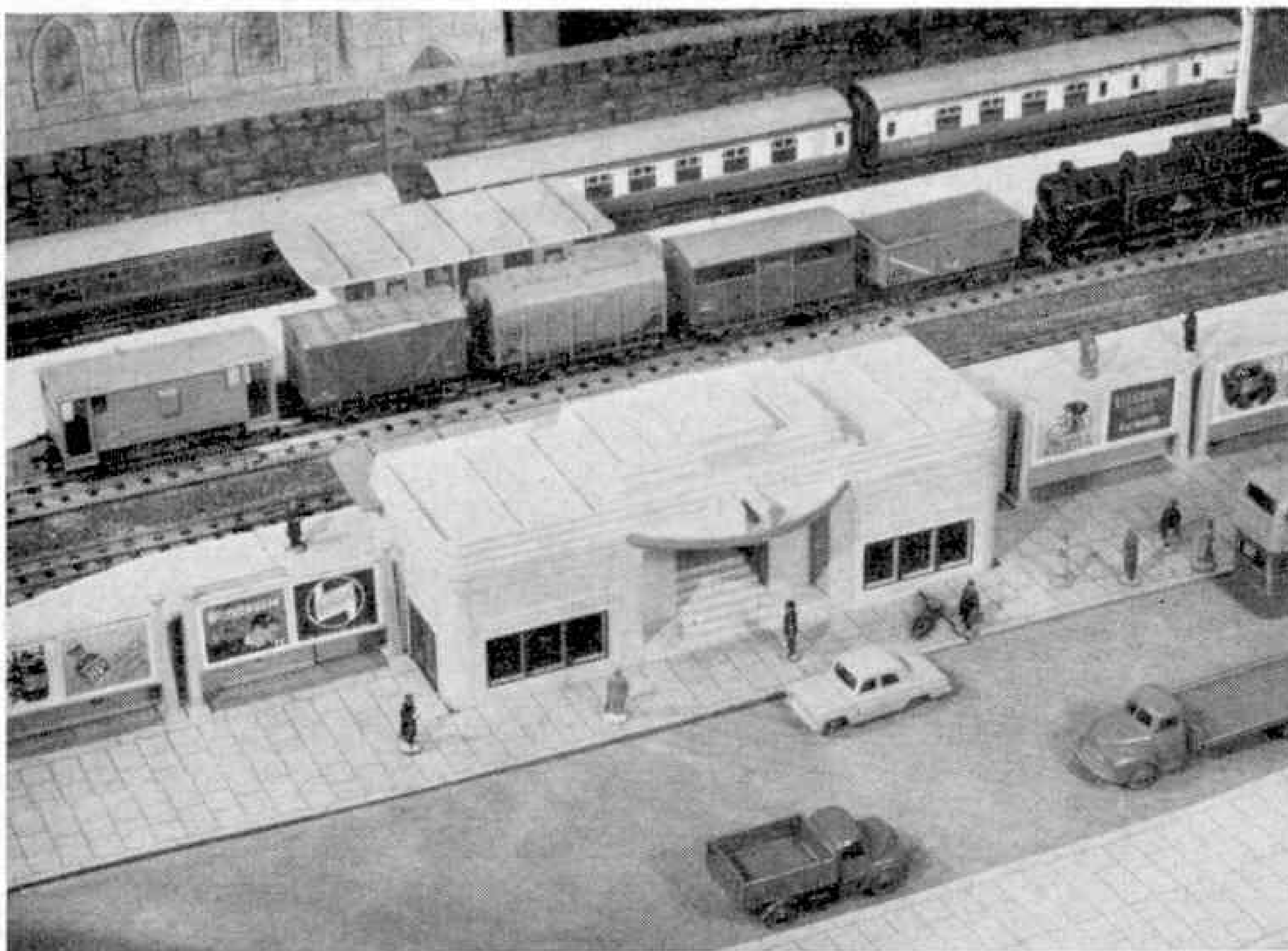
The yard shown in the foreground of the illustration is only part of the goods traffic arrangements. Loops extend beyond the left hand limit of the illustration and beyond this again are several sidings and a goods shed. Trains can enter the reception loops at either end from the main line and, with Uncoupling Rails at suitable spots, shunting and marshalling can be carried out clear of the main line track.

enthusiasts busy with a system that they put together for their school art exhibition that formed part of a garden fete.

A neat and tidy arrangement characterises the railway shown in the lower picture, which was set up by *M.M.* reader and Hornby-Dublo enthusiast Brian Kuss, of Queensland, Australia, whom we have met before in these pages. The layout was arranged in conjunction with a local dealer.



Brian Kuss, Queensland, Australia, arranged this display layout, to the obvious delight of those looking on in this picture.



Outside this Hornby-Dublo Station are some people and motor vehicles. One of the people appears to have been knocked down, but nobody seems worried about it yet!

Outside the Railway

AT one time a miniature railway was just railway, and practically nothing else. There are still layouts of this kind, sometimes because of space restrictions or because the layout has to be put away when not in use. Generally speaking the tendency now is to devote a great deal more attention to what we may call lineside matters. This is all to the good, because a layout has a much more natural and pleasing effect if the surroundings of the line are appropriate, and where the balance is successfully struck between railway operating requirements and the scenic side of things.

Where the situation of the station platforms and buildings allows, it is usual for the miniature railway owner to endeavour to arrange a good lead-up to the station premises. This can be done easily with Dinky Toys Pavements. But even if one can do no more than place a few miniature road vehicles and figures around and about the station, it will help to dispel the idea that the layout is "all railway" and nothing more, and this is something that should always be done.

The Hornby-Dublo owner is fortunate in having Dublo Dinky Toys at his disposal and the picture above shows how perfectly they fit into the railway scene. The two

most recent additions are particularly suitable for use in conjunction with railway station layouts although neither of these two new vehicles appears in the illustration here. One of them is No. 067 Austin Taxi, which the Toyman has already told you about; the other, No. 068 Royal Mail Van, is mentioned on page 244 of this issue.

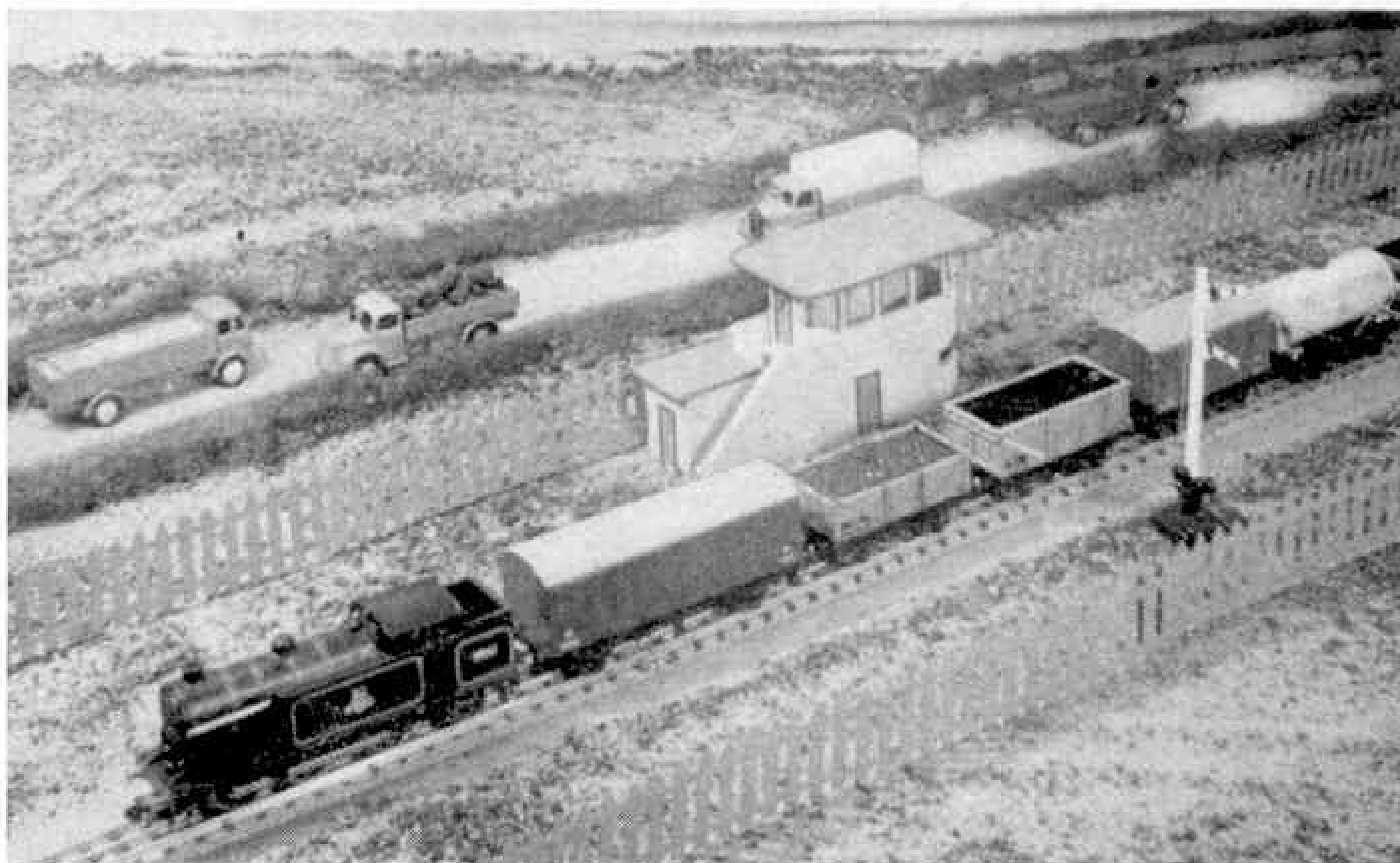
Incidentally, as will sometimes happen, one of the miniature figures on the pavement outside the Station appears to have fallen or, at least to be in need of assistance. Has he been disturbed by the operator's hand, in the course of cleaning, etc., operations? At all events there would appear a need for summoning a miniature ambulance and the Hornby-Dublo owner could be excused for introducing Dinky Toys No. 253 Daimler Ambulance into such a scene. This vehicle is really a bit too big for Hornby-Dublo purposes, but after all real ambulances do vary in size and the younger members of the railway staff who drive Dinky Toys would probably welcome such an emergency.

While on road topics our attention may well be directed to the upper illustration opposite, in which the scene beyond the railway might well be entitled "the coast road." Certainly the stretch that is beyond

"The Coast Road" might well be the title to this illustration. Here railway and road run parallel, in the manner often necessary on miniature layouts, as in actual practice.

the road, so to speak, does merge into the background in a manner that suggests a coastal stretch. Incidentally, you will notice that the motor vehicles shown there are not of the Dublo series of such vehicles. You can easily pick out what they are and except for the Leyland Forward Control Lorry, Dinky Toys No. 420, which is very nearly the right size, the others can be regarded as big examples of their respective types. This is not unreasonable; road vehicles seem to be growing bigger every year as well as more numerous!

The railway line is bounded by fencing assembled from wood or card strip, as sometimes recommended in these pages. Alternatively, industrious enthusiasts may prefer to do the drawing and cutting out necessary to produce such fencing in one-piece units of suitable length. The hedges along the highway can be formed of steel

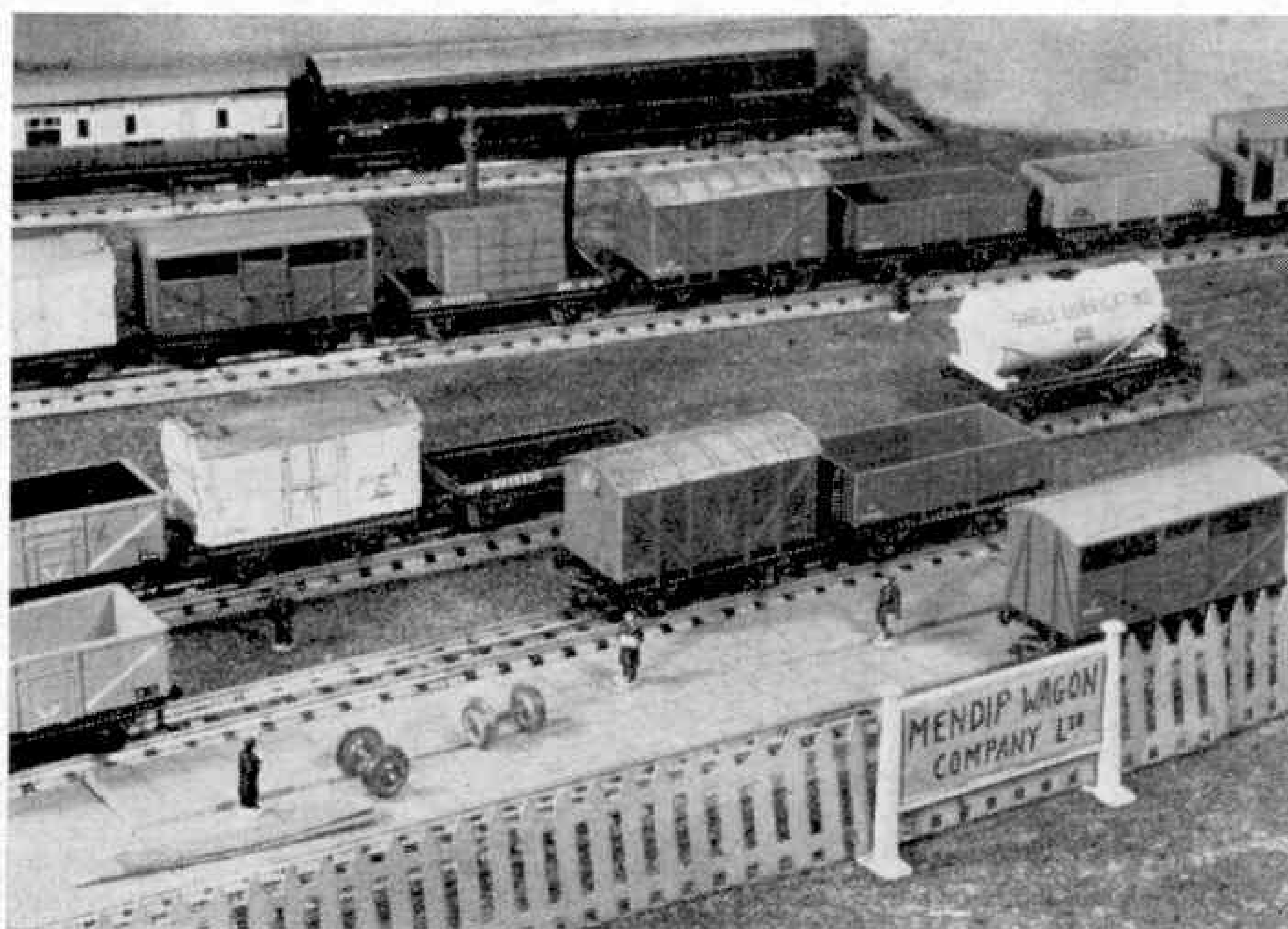


wool, foam rubber or other material that may be ready to hand, suitably coloured. Those who are not good at this sort of thing can usually find something suitable in shops that provide for the miniature railway and other hobbies.

Industrial establishments of various kinds often find a place in Hornby-Dublo layouts and where space permits some realistic and elaborate installations can be arranged. Colliery sidings with appropriate loading gear, quarries or liquids-in-bulk installations will call for appropriate wagons for railway traffic. Then there are the needs of the railway itself in the maintenance of its locomotives and rolling stock.

The extent to which buildings and so on are provided will be governed by the ideas of the individual owner, but it will usually be possible to devote perhaps one siding to serve a wagon repair plant or something similar. This can be quite a small affair, like that shown in the lower picture here. It can be privately owned.

Wagon repair sidings make an interesting feature on this layout. A realistic effect is given by the placing of several sets of wheels and axles on the ground between the tracks.



A Fine Layout for Station Working

By 'Layout Man'

THIS month, for a change, we have a diagram to look at, showing a Hornby-Dublo layout that includes a number of interesting features. This shows the system of *M.M.* reader R. H. Sharman Crawford, of Torquay, on which the station filling what is the West side of the system is appropriately named *Crawford*.

This station is built up with the standard Hornby-Dublo components. The Through Station with appropriate Platform Extensions is used on the inner or down side, the other platforms being built up from the standard Island Platforms, again with Extensions. The result is very pleasing, particularly as Signal Cabins and Footbridges are used at both ends, which should be done at an important traffic centre.

The layout as a whole is straightforward, providing a double track main line following the baseboard contour, the base actually covering an area 8 ft. 3 in. by 7 ft.

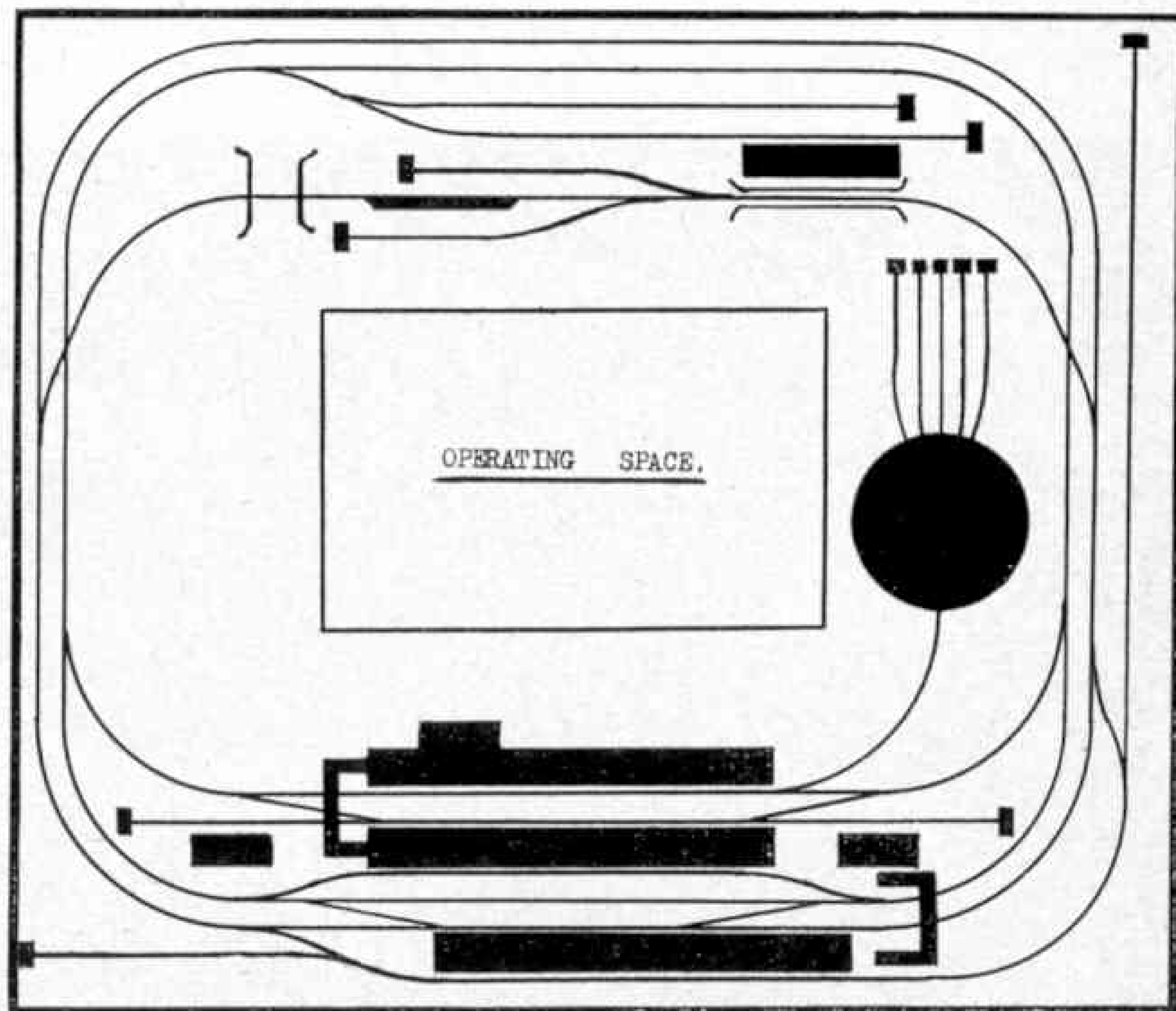
The track layout at *Crawford* is worth examining. In addition to the through main lines, one of which avoids the platforms by running through the centre of the station, there are loops that are particularly useful for stopping trains, and there is an inner single track that is doubled as it passes between the centre Island Platform and that of the main or Through Station. The loop thus formed is prolonged at each end beyond the respective crossover Points to form short spurs, or buffer stop sections.

The provision of sidings for particular purposes is a feature of the system, for on the East side, in the upper part of the diagram, there is a goods depot, which helps to give a busy aspect to an otherwise countrified area. Between this section and the central operating space there is another single track

loop incorporating in turn a Level Crossing, T.P.O. Lineside Apparatus, and a Girder Bridge. In addition there are two sidings, in one of which the T.P.O. Mail Van is kept when not in use. It is quite a good idea to have a separate siding for this rather special item of rolling stock, which can thus be drawn out when required. The other siding is used for stabling Coaches.

The Turntable is sited in a convenient spot for the operator to work it, and the layout of the off-going tracks follows the usual standard. Access to the Turntable is gained from the innermost platform track at *Crawford* and engine movements between the main line and the Turntable and locomotive yard sometimes call for some interesting manœuvres. This is particularly so if there are trains already occupying different sections at the station.

Hand operation of Points is the rule, which gives the operator plenty of work to do. Isolating and Uncoupling Rails are found in various sidings and the space between the railway itself and the operating "well" has been used for the development of the town of *Crawford*, with road, houses, shops and other buildings.





Club and Branch News



WITH THE SECRETARY

A FINE RECORD OF SERVICE

From time to time I have referred on this page to Meccano Club Leaders who have given many years of splendid service to their Club and to the Guild. My picture this month is of another of these enthusiastic stalwarts—Mr. Maurice C. Hodder, whose recent retirement from Club Leadership ended a 34 years' association with the Meccano Guild. It was in 1919—40 years ago—that Mr. Hodder became connected with the St. James' Choirboys' Club, Exeter, and on 6th January, 1920 he became its Leader. In April 1925 the Club was affiliated with the Meccano Guild, and changed its name to Exeter M.C. Mr. Hodder remained its Leader until the Club closed down in the autumn of 1955. He was then also Leader of another Exeter organisation, the St. Thomas M.C., and he continued thus until this Club ceased activity at the end of last year.

Naturally, this fine record of service for youth has made Mr. Hodder a well-known welfare worker in the Exeter district, and in acknowledging his splendid service to the Meccano Guild we at Headquarters wish him a long and happy retirement.

CLUB NOTES

ASHTED FREE CHURCH M.C.—At one meeting, a very useful talk on designing Meccano models was given, after which the members designed their own models for a forthcoming competition. The subject of one model-building evening was *Bridges*, and the types built included lift, girder, swing and tower bridges. On another occasion a film strip about the development of British Railways was shown. A talk on *Motive Power* gave members much useful information about electric motors, dynamos and steam engines. *Secretary*: M. Kippax, 132 Craddocks Avenue, Ashted.

NORTH END (PORTSMOUTH) M.C.—The Anniversary Party was a great success. The guests included the Managing Director of a large furnishing company in North End, who showed great interest in the Club and its associate H.R.C. Branch and commented favourably upon the presence of members as young as 6 to 10 years. He has promised to exhibit a working model in his shop window for a week, with a notice about the Club and Branch. Photographs were taken by the Club photographic section. Models built recently have

included a trolleybus and a tramcar. At a photographic section meeting members watched a roll of film being developed and printed. A radio and television section has been formed and meets on Tuesday evenings. *Secretary*: Mr. A. J. Nicholson, 213 Sultan Road, Buckland, Portsmouth.

AUSTRALIA

MELBOURNE M.C.—At one meeting Peter Fisher screened colour film slides of his holiday travels in Sydney, and at another Keith Buckland screened historical black and white slides of Victoria's disappearing narrow gauge railways. The Hornby-Dublo T.P.O. Mail Van was demonstrated at one meeting. *Secretary*: Mr. L. Ison, 8 Hayes Street, Northcote N.16, Victoria, Australia.

BRANCH NEWS

PENWORTHAM COUNTY SECONDARY SCHOOL (PRESTON)—A model railway exhibition was given last Christmas and was very successful. Plans have been made to visit the B.R. Locomotive Works at Horwich. *Leader*: Mr. J. Dawson, Penwortham County Secondary School, Nr. Preston.

KIDDERMINSTER MODEL RAILWAY CLUB—For some time the Branch has been using the Secretary's own extensive Hornby-Dublo layout. It has aroused much interest, mainly because of its size—16 ft. by 4 ft. At the time of writing the members are looking forward to the annual outing to London, to visit the Model Railway Exhibition at Central Hall. It is hoped to visit Branch Headquarters at Liverpool this summer. *Secretary*: E. J. Ward,

27 Whittall Drive, Kidderminster.

AVIARY MODEL RAILWAY CLUB (LEEDS)—The Leader, Mr. Myers, and three members have been busy assembling his clockwork layout in the room adjacent to the one housing the Branch electric track. Scenic items under construction have included fences, hedges, a pond, and advertisements. *Secretary*: J. Baker, 10 Salisbury Terrace, Leeds 12.

AUSTRALIA

ST. ALBANS AND NORTH PORT RAILWAY—One of the new Hornby-Dublo 8F 2-8-0 locomotives has been bought, and allocated to the North Port Loco Shed. The street tramway system continues to be developed. *Secretary*: Mrs. A. M. Skiller, 101 Chandos Street, Haberfield, New South Wales, Australia.



Mr. Maurice C. Hodder, of Exeter, who recently retired after nearly 40 years as a Meccano Club Leader. His long association with the Guild is referred to on this page.

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Stamp Collectors' Corner

By F. E. Metcalfe

PAKISTAN

The story I am going to tell started in 1947, when Pakistan came into existence. There had been no time to prepare new stamps for the new Dominion, and the KGVII issue of India were on sale in the post offices. What was more natural than that the stamps available should be overprinted? And this is precisely what happened. The chief postal authorities have always denied the official character of these overprints, but all over the country postal officials were overprinting the word PAKISTAN on all their stamps, in black or purple ink, and in countless forms.

In spite of the fact that these overprints have been officially disowned, they should not be ignored by philatelists, for they are full of interest. Here is what the Commonwealth Catalogue has to say about them, "Stamps of India overprinted PAKISTAN in various founts and colours exist, made mostly under Provincial Government authority. Some of the overprints were machine printed, others were hand stamped, and occasionally the overprint was applied after stamps were affixed on the postal package. A number have been found with the overprint partly on the package itself."

From this it will be seen, that whatever the official attitude may be towards these "provisionals," if any come a collector's way they are worth a place in the album.

The first definitive stamps were issued in 1948, and there are two interesting points to be observed. First

of all the set provides a bit of a nightmare for those who are not interested in perforation varieties, for several different ones are involved, including the 15r. perforation $14 \times 13\frac{1}{2}$ (C), which is catalogued at £7, against the more normal perforation $11\frac{1}{2}$ (C), which is listed at only 32/6; so here is a stamp worth looking out for.

One of the designs is worth attention because a mistake was made that was rectified later. The designs

of the 1a, $1\frac{1}{2}$ a, 2a, 3a, 6a, 8a, 10a and 12a showed what is described as a waning Moon, that is one with the horns turned to the right, as can be seen from the illustration. Now these things are considered important in the East. The waning Moon there apparently



suggests something of ill omen. So the two designs of the eight values were rectified and the Moon turned round with the horns pointing left, thus changing a waning to a waxing Moon.

Next we'll consider the special issues, which present a quite awkward problem to catalogue editors. In the Commonwealth Catalogue, which lists all Pakistan stamps, the special issues, that is the commemoratives,

etc., are listed in a separate section, so that a mix-up between definitives and specials is avoided. But Pakistan has adopted a method whereby certain stamps are issued for special anniversaries, with the intention that they shall continue on sale for an indefinite period. This plan is not followed for all special issues, however. So some of the sets went off very quickly, and are well worth going after.

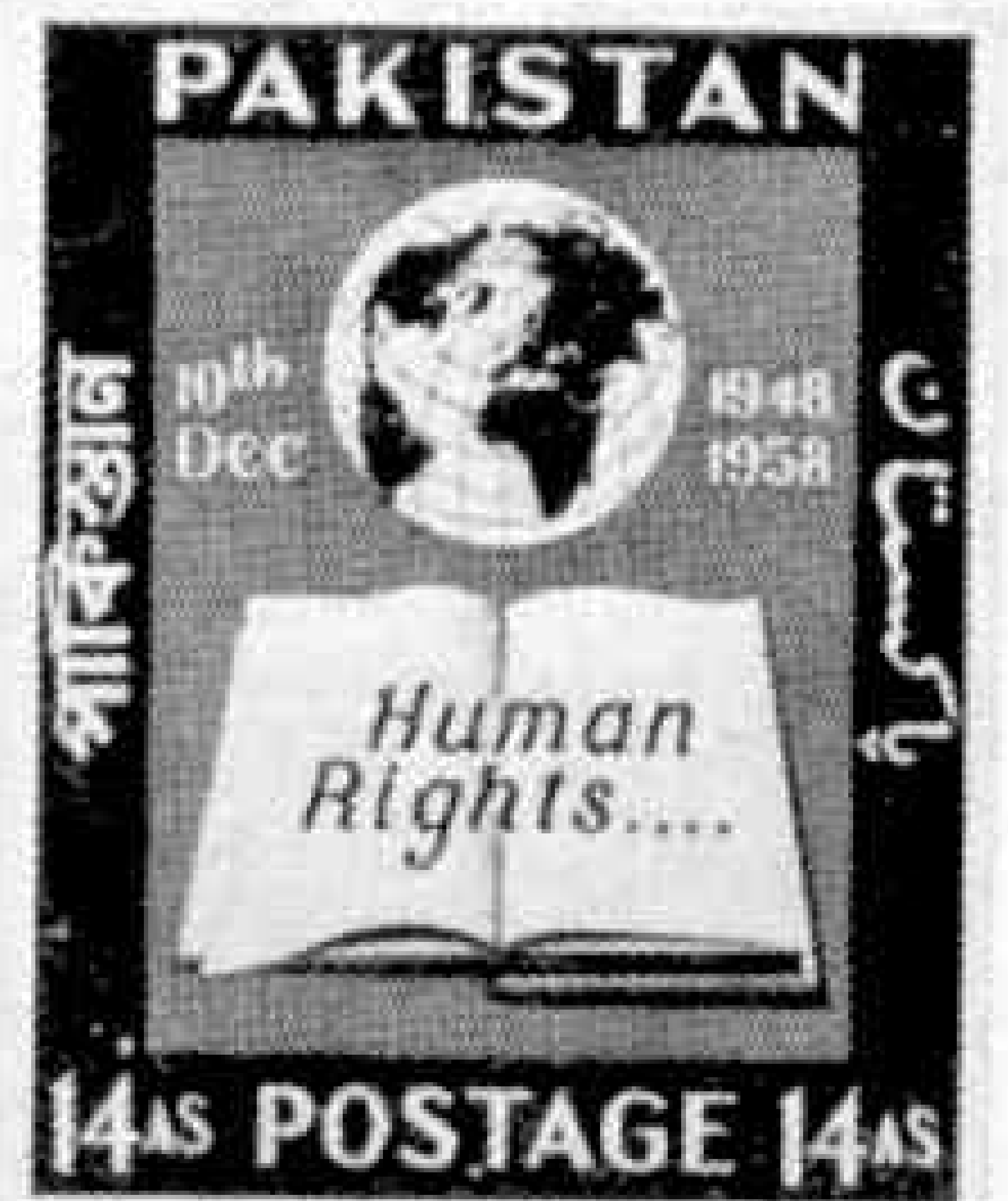
There was a set of three stamps issued on 11th September, 1949, to mark the first anniversary of the death of M. A. Jinnah, the man who played the major part in Pakistan's creation. It will be noticed that as Pakistan is a Moslem country no portrait is depicted on any of its stamps, so the design of this "Jinnah" set merely shows what is no doubt intended to be an epitaph.

The first special issue made during the present reign—Pakistan is a loyal member of the Commonwealth—commemorated the centenary of India's "Scinde Dawk" postage stamps. Care was taken this time to see that the horns of the Moon were turned to the left. There are two stamps in this set, and as they can still be obtained for about four shillings they are to be well recommended, for they are gradually becoming quite scarce.

A stamp that will appeal specially to many M.M. readers was issued on 26th January, 1955, to commemorate the climbing of mountain K2, or Mount Godwin-Austen. This stamp only costs a copper or two, so it is not only easy to obtain, but also easy on the pocket, which is how I like stamps to be, at any rate.

The next special issue, which had only a short life, appeared on 24th October, 1955. Two stamps of the 1954 issue—this latter is one of the sets issued on an anniversary that are being maintained on issue indefinitely—the $1\frac{1}{2}$ a and 12a values, were overprinted to commemorate the 10th Anniversary of the United Nations. The $1\frac{1}{2}$ a value was only on sale for a few days, and the 12a went off shortly afterwards. In mint condition the low value is undoubtedly scarcer than the high, because while the numbers overprinted were the same, there was a much larger postal use for the $1\frac{1}{2}$ a and before many collectors got round to buying all the latter had been used up for postage. The Pakistan Agency in London was in time to get two lots of the 12a, but only one of the $1\frac{1}{2}$ a. This is another set to buy now, for although the two stamps will cost getting on for 10/- I think they will increase further in value as time goes on.

Other special issues have appeared from time to time, two quite recently for 10th December. Two stamps were issued to mark the 10th Anniversary of the Declaration of Human Rights, and on the 28th of the same month two of the previously issued specials-cum-definitives were overprinted to commemorate the Second National Jamboree, held in Chittagong.



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Stamp Gossip

"UNITED EUROPE"

Turkey is about the most interesting of countries that anyone could visit. It has everything in abundance, and can provide its visitors with a very fine holiday. But it is of course the stamps of the country about which I want to say a word.

Recently I saw a collection of modern Turkish stamps and was again impressed by the beauty of some of them. Along with Israel, Turkey must be producing some of the best stamp designs in the world. Just examine the stamp illustrated. Note the sheer simplicity of the layout; yet how effective it is, and what a contrast to the overloaded fussy designs generally produced for our own special stamps.

This 40k stamp is one of a set of two issued in honour of United Europe.



BRONCHOESOPHAG- OLOGY

Yes, I thought that would make you sit up and take notice. Just look at the Japanese stamp reproduced here. Note the interesting design, and then also that it was issued to mark the International Congresses of Chest Diseases and—that big word at the heading of the paragraph. I won't try to write it again; I or the printer might not get it right this time.

Whoever in the old days would have attempted to make a stamp design out of nothing more than a doctor's stethoscope? And the result is quite attractive.

MINIATURE

Two readers have asked me recently about miniature sheets. One of them wrote that he did not collect them, for they were obviously made for sale to collectors.

Generally speaking this is true, but before I go into that a word as to what miniature sheets are. Briefly, they are specially made up of from one to say half a dozen sets of stamps; sometimes a sheet has only stamps of one value, as in the case of New Zealand. In others, all of a set, as the recently issued sheet for Ghana. But what a difference between the objects motivating the issue of these two sheets. The one for New Zealand merits the support of everyone, for it is associated with the well-known N.Z. Health Stamps, the surcharge from which goes to support children's health camps. That for Ghana has no such purpose and can safely be left alone.



MOUNTAINS OF IT

We smile in a rather superior way at those city dwellers who are supposed to believe that milk comes from tins. But I came across a new variation of this recently when I heard a remark made by a young country collector when he saw the stamp of New Zealand here illustrated. He remarked "Gosh, we always get our salt in packets."

I suppose he knew all right that salt no more starts in packets than does milk in tins. Yet most of us have a rather sketchy knowledge of the origin of many of the commonplace things we see every day. Incidentally this N.Z. stamp is one of a set of three issued by our sister country on 2nd March to commemorate the centennial of the Province of Marlborough. As the set will go off sale at the end of May, now is the time to buy one if you want it at the current rate, which will be about 1/6. A low price for a most attractive issue.

THE PERSIAN GULF

It has been known for some time, that Kuwait, the Persian Gulf territory, was to cease using British stamps overprinted and have its own particular issues. As a rule, definite notice is given when such a change is to take place. This allows dealers and collectors to fill up before the new stamps appear. Alas, this time there was no prior advice beyond the preliminary notice, received on 1st February.

This later definitive set is quite nice, and there is an interesting point about it. Before the beginning of February, as Kuwait was not a member of the U.P.U., any of its own stamps—and it had three values, of a design similar to the one illustrated—could not be used on mail leaving the country. But now, being a U.P.U. member, the situation has changed, so two of those "locals," the 5np and 10np, have been incorporated in the new issue.

There is a lot doing philatelically as well as in other fields in the Gulf. I think an article might be of interest to readers, so I will see about gathering some data for use in the near future.



TIP OF THE MONTH

It is not often that one can tip our own modern British stamps as being worth buying. But this month I am going to suggest that a mint set to 1/6 of our own "QE" stamps, with the St. Edward's Crown watermark, may be well worth buying.

The first watermark used for our "QE" stamps was what is known as the "Tudor" crown, and then along came the "St. Edward's"; and now stamps of the former are bringing double face. In view of this it might be thought that collectors would have been on their guard when the second watermark change was announced, but there are always those who lag behind. I know first hand that many have missed the 1/- value for one, and there may be others. So look round for the "St. Edward's" Crown watermark set now. You'll probably have to pay a bit above face value, but not very much, certainly not as much as you might have to do in even a few months' time.

Fun at Binns Road



ONCE again we have to congratulate the holder of a Dinky Toys Collectors' Licence, selected from the great number so far issued by Stirling Moss, that gave him the privilege of paying a visit, as a Very Important Person, to the wonderland in which Dinky Toys and Supertoys are made, as well as Meccano, Dinky Builder, Hornby and Hornby-Dublo Trains. He is Stewart Wicks, of Bromsgrove, Worcestershire, who has Licence No. 53271, and was

accompanied by his mother and his younger brother Ian.

The picture on this page gives just one glimpse of the happy time that the visitors enjoyed. Both boys were of an age to appreciate thoroughly the process by means of which their favourite toys are made. They talked with heads of departments and, as usual on these occasions, they also had the pleasure of meeting Mrs. U. P. Hornby, a director of Meccano Limited.

How Ferodo Test Brake Linings

Few people realise how hard the brake linings of their cars have to work, for they are unseen and out of mind. But they do indeed work hard, and in order to keep pace with ever increasing demands for more powerful braking, Ferodo recently built new Research Laboratories at Chapel-en-le-Frith, in Derbyshire, which were opened on 21st November last by H.R.H. Prince Philip. These are the largest of their kind in the world. They cost three quarters of a million pounds to build.

Before any brake lining goes into production it has to undergo an equivalent of thousands of miles performance testing on machines in the Research Laboratories, followed by thousands of miles on vehicles of the Ferodo Test Fleet.

In the Test House of the laboratory, twenty electrically controlled machines are in operation day and night. The largest, with solid flywheels and capable of storing sufficient energy to fling a twelve stone man three times the height of Everest, are used to investigate the characteristics of new materials designed for heavy commercial vehicles, buses and lorries.

The control panels of other large machines with variable flywheels have been so designed that no matter how complicated any combination of braking conditions, whether they are those of a sports car on Alpine roads or a bus in London traffic, they can be reproduced and the behaviour of the linings recorded automatically.

Although machines can reproduce the basic elements of braking conditions, they cannot simulate the

actual behaviour of a vehicle at different times of day and in changeable road and weather conditions, nor with them can the driver "feel" his brakes. So linings that pass these gruelling machine tests are then road-tested. The test fleet comprises motor-cycles, small and large family saloons, high performance sports cars with disc brakes, several lorries and a bus. Each vehicle is virtually a laboratory on wheels, equipped with instruments to indicate how hard and how often the brakes are applied and what happens when they are.

Test cars with the highest performance will do 100 miles in the morning and another 100 in the afternoon, while the 10-ton lorry takes a whole day to cover 100 miles. These runs show how the linings behave in conditions of ordinary motoring and then, after at least 3,000 miles, the Ferodo Test Track is used. This is a private road, part of the old Peak Forest Tramway, where drivers can carry out trials in extreme conditions, uninterrupted by other traffic.

A typical test of the type carried out is the "fade" test, which is designed to study the effects of repeated hard braking on steep hills. In this 50 stops at one minute intervals, keeping a record of the pedal pressure, are carried out from a speed of 50 m.p.h., and from higher speeds for sports cars, with a steady $\frac{1}{2}$ g deceleration, that is to say half that of gravity.

Then, after a one minute pause come a further series of tests to investigate the linings' recovery. These are again at one minute intervals but at 30 m.p.h., and with a record being kept of the deceleration until it returns to what it was before the tests began.

Fireside Fun

A famous restaurant had this sign prominently displayed on the wall: "We make every kind of sandwich in the world. Just ask for it!"

Late one night a joker demanded a whale sandwich. The waiter stalled and said, "I'll have to speak to the boss." He came back after a hurried consultation and reported, "The boss says he's sorry, but he can't cut up a whale just for one sandwich."

A father and son were posing for a picture at the time of the young man's graduation from University.

"Stand a little closer to your father," said the photographer to the youth, "and put your hand on his shoulder."

"I think it would be more appropriate," said the father, "if he stood with his hand in my pocket."



* * * * *

Old Hen: "Let me give you a piece of good advice."

Chick: "What is it?"

Hen: "An egg a day keeps the axe away."

* * * * *

"Well, sir," said the friendly waiter, as he placed the bowl of hot soup before a customer. "It certainly looks like rain, doesn't it?"

The customer looked at the bowl, and sniffed slowly.

"You're right," he said grimly, "but it does smell a bit like soup."

* * * * *

Heard at a Swiss holiday resort: "Here come his skis—he can't be far off."

"Don't worry, lad! The only gorillas in this country are safely in captivity!"

Showing his daughter's painting to a friend, the proud father announced, "She's studied abroad, you know."

"Ah, that explains it!" cried the friend. "I've never seen a sunset like that in this country."

* * * * *

"Did you hear the weather forecast?"

"Yes."

"What is it?"

"Dunno. They haven't decided yet."

"Haven't decided?"

"No, it said 'outlook unsettled'."

* * * * *

"Bertie," the teacher called to the day-dreaming boy. "Do you have trouble hearing?"

"Oh, no, Miss Johnson," Bertie answered promptly. "Just listening."

* * * * *

Excited Professor (driving a high-powered car): "We've got it at last!"

Second Professor: "Got What?"

First Professor: "Perpetual motion. I can't stop the thing!"

* * * * *

"You must realise," said the doctor to the old lady in his surgery, "that I can't make you grow any younger."

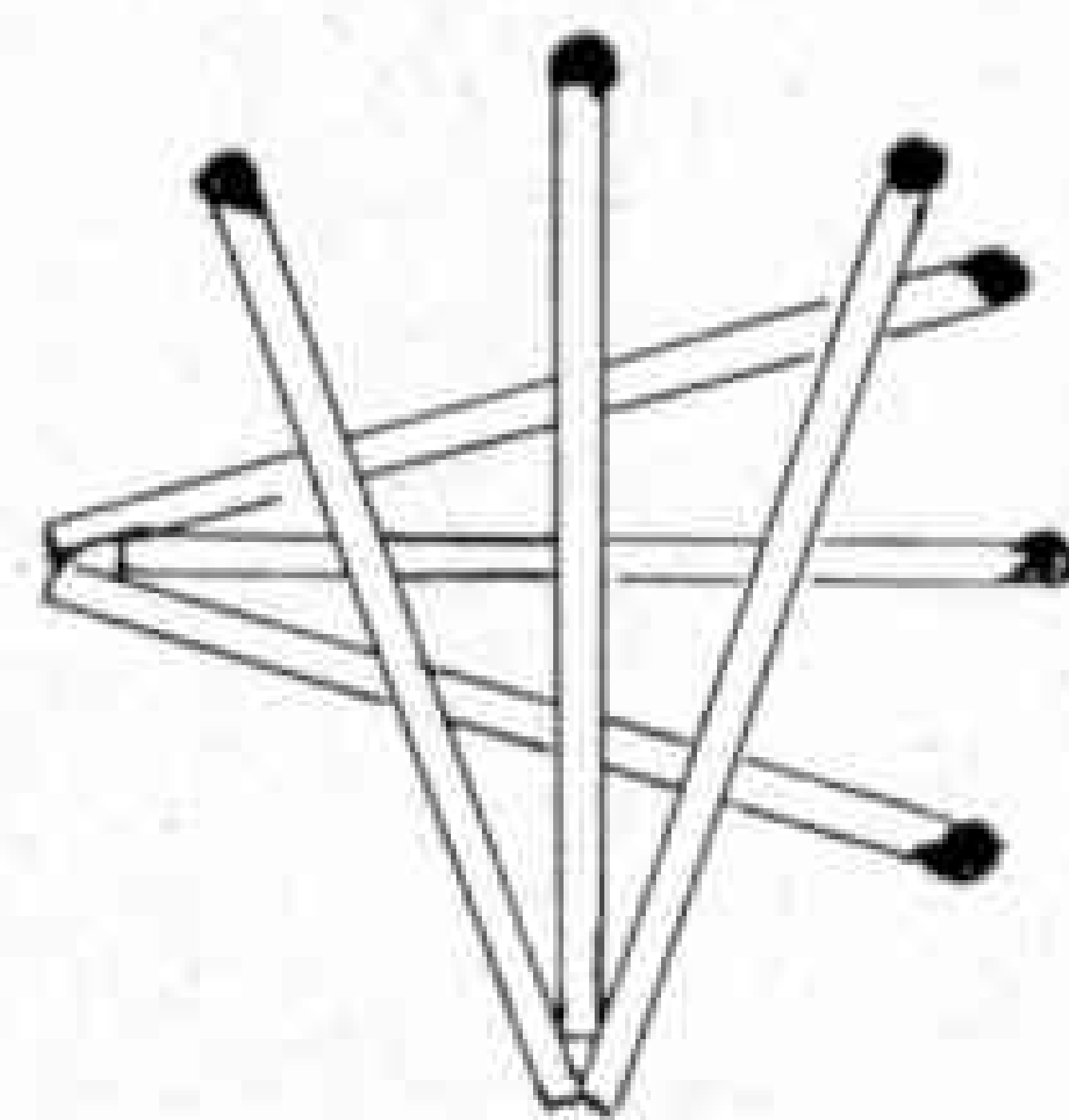
"Ah don't want to grow any younger, love," she replied cheerily. "Ah just want to keep on growing older as long as Ah possibly can."

BRAIN TEASERS

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Can you make sense of the following jumble of letters?

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If the six matches are set out as shown in the sketch above it will be found that each match touches all of the others.

Five Minute Crossword

The solution to the Crossword is shown alongside.

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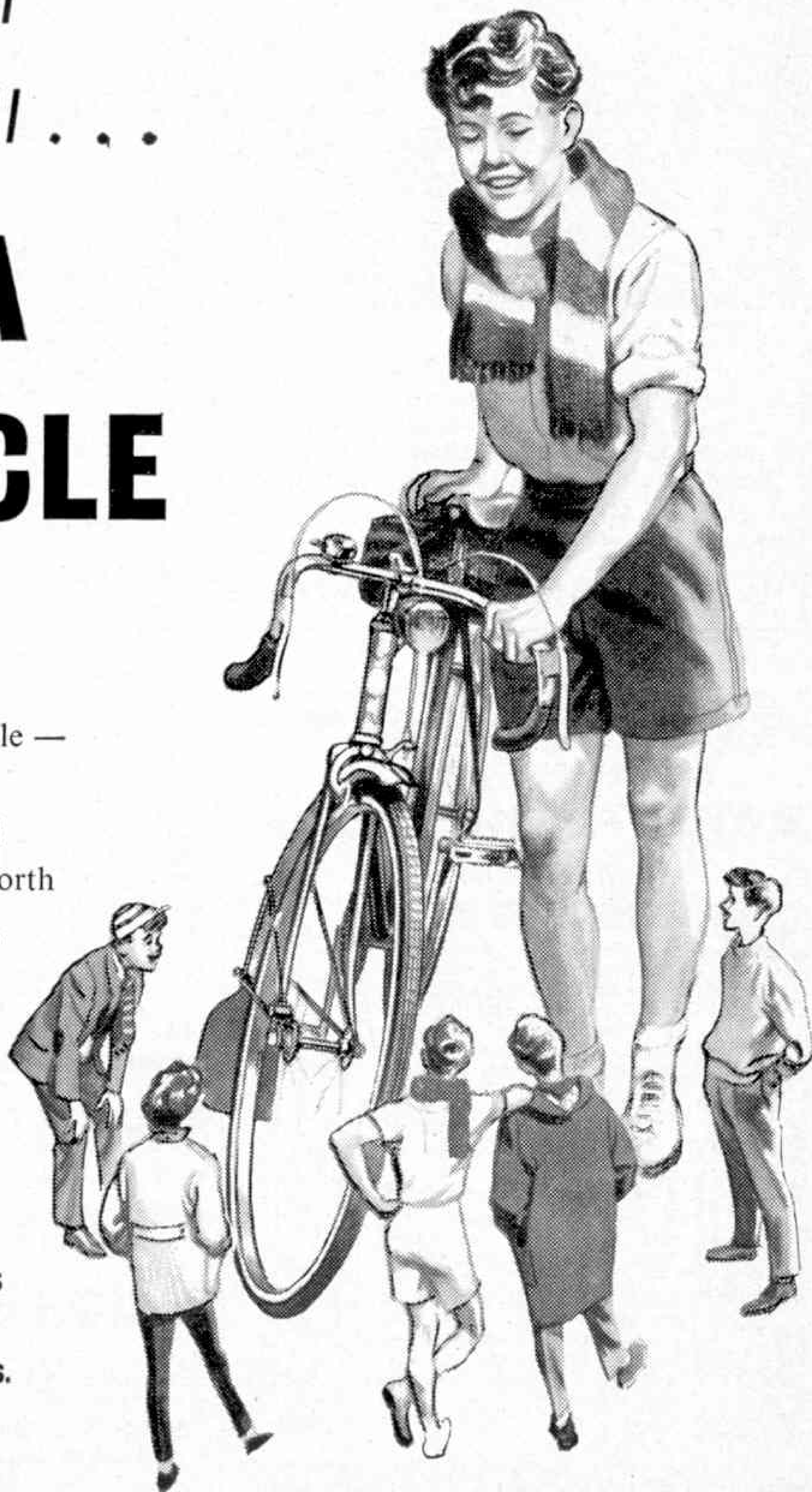
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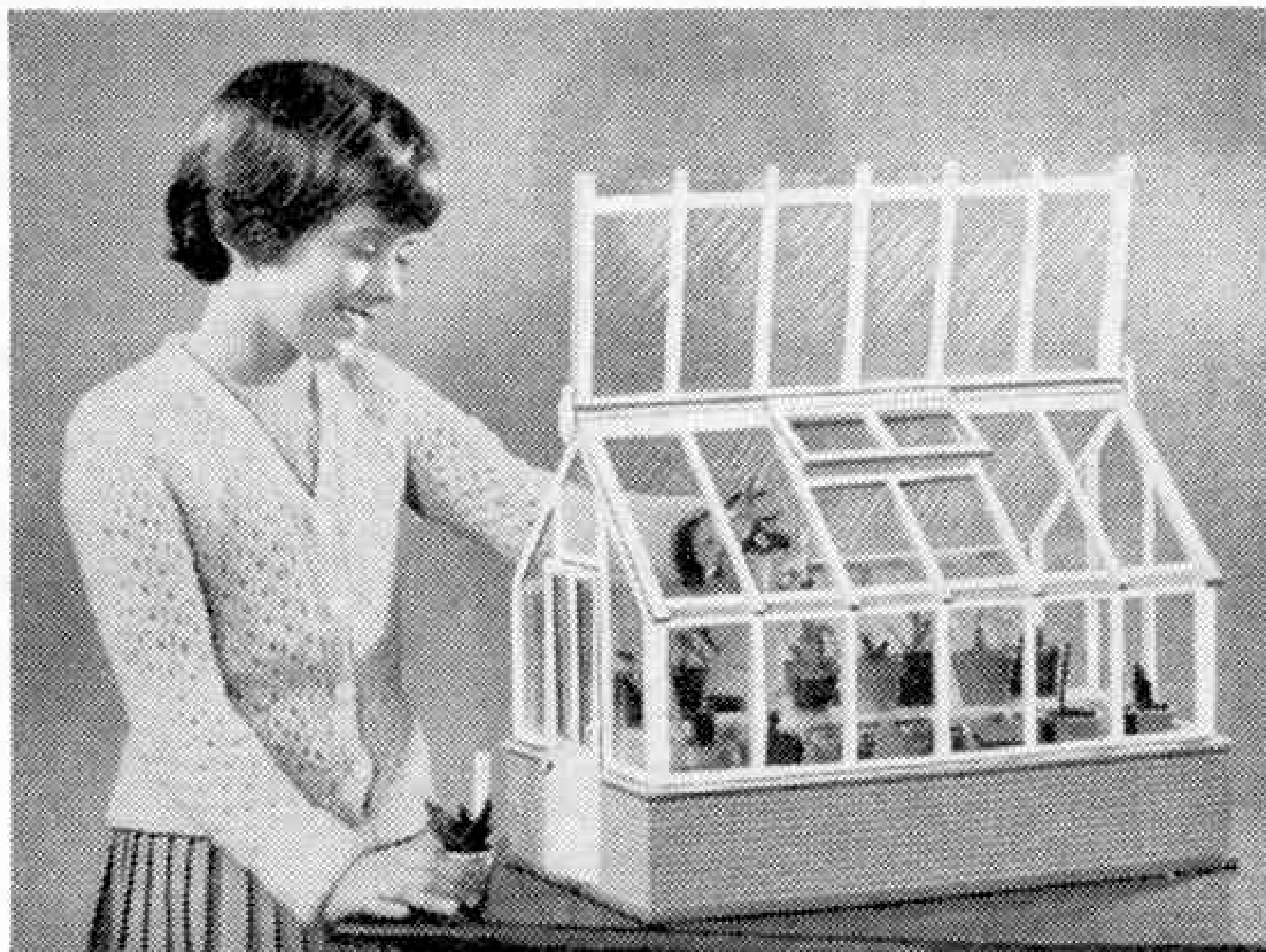
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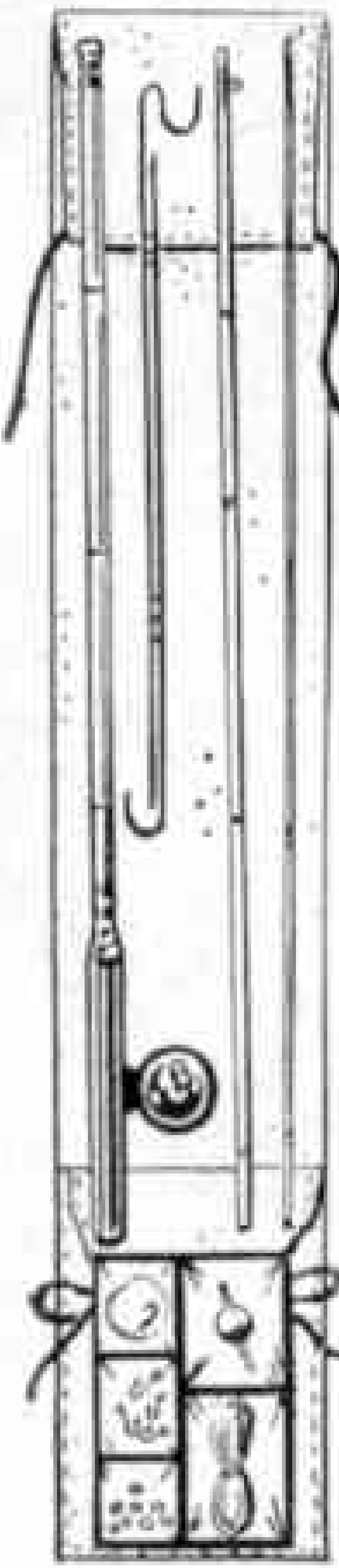
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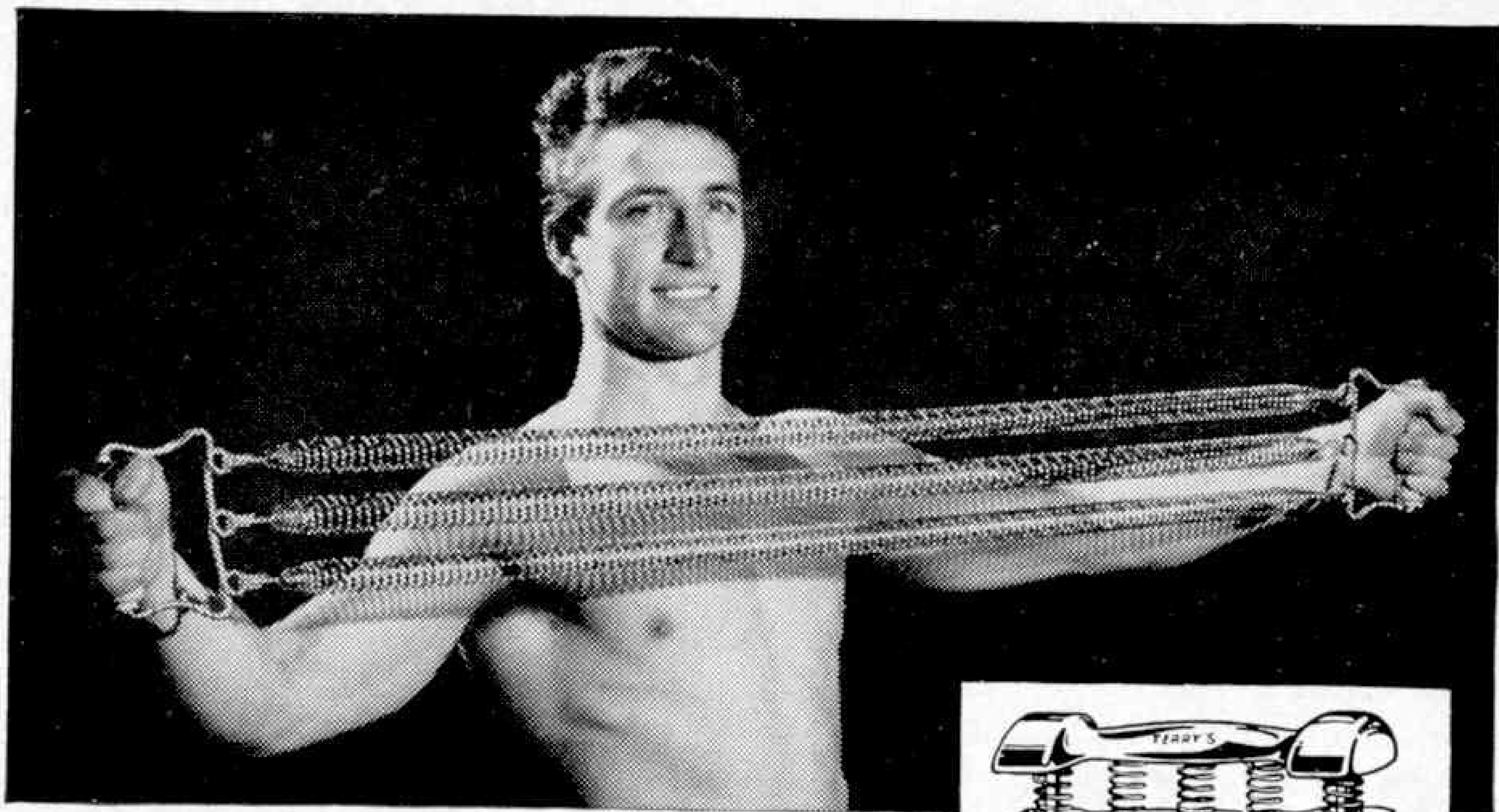
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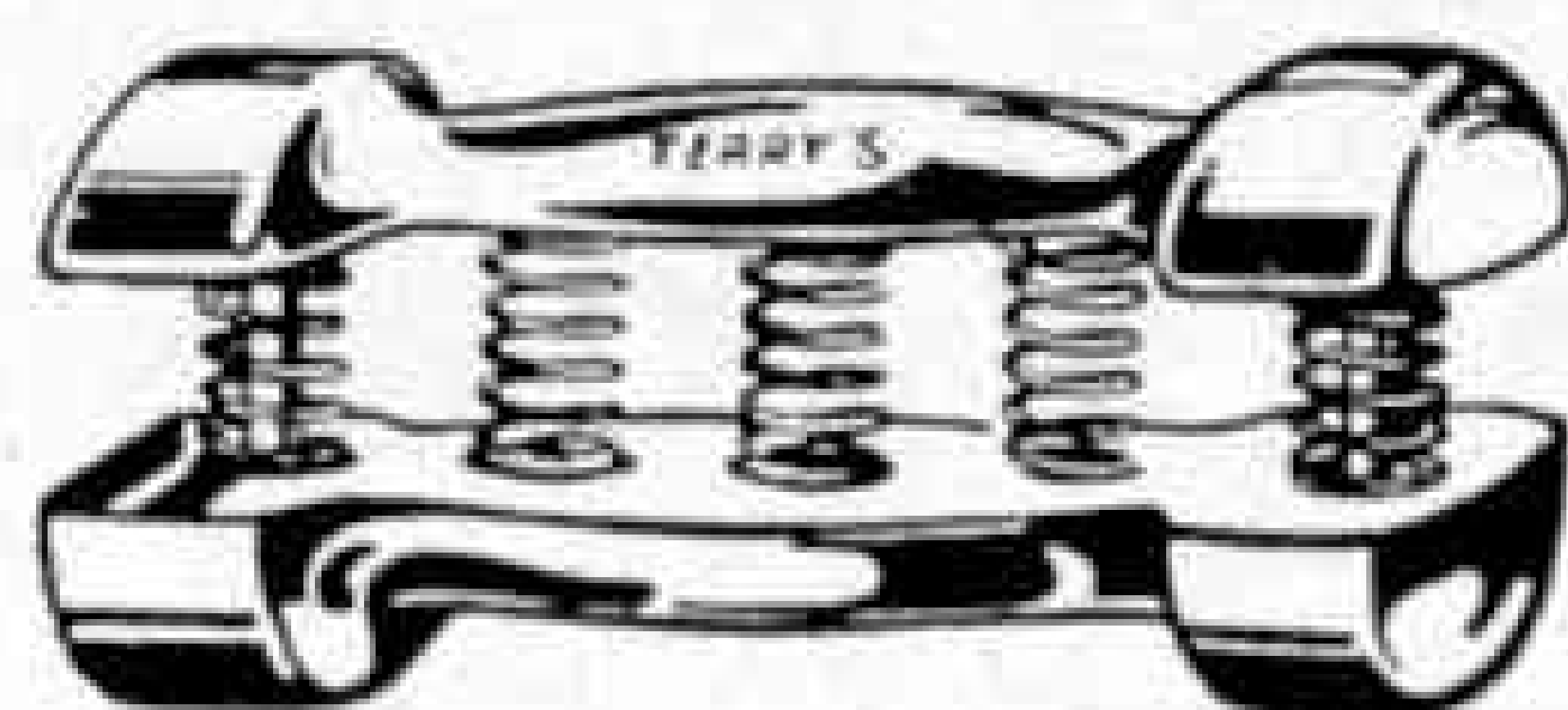
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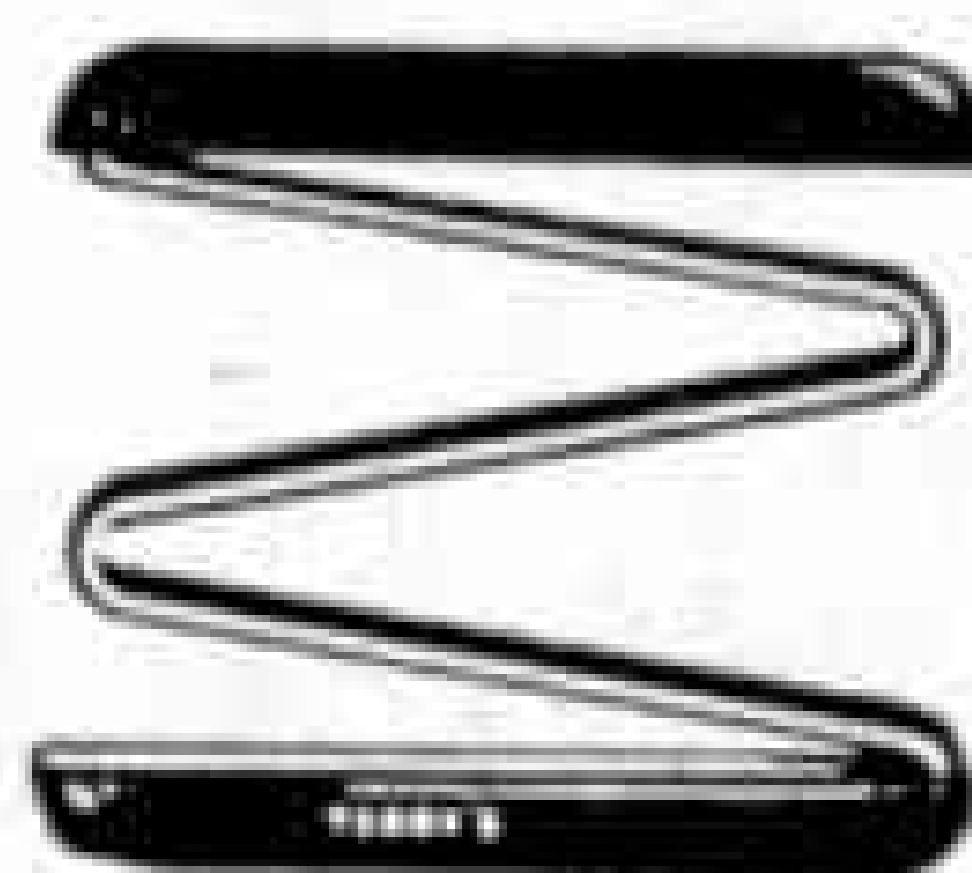
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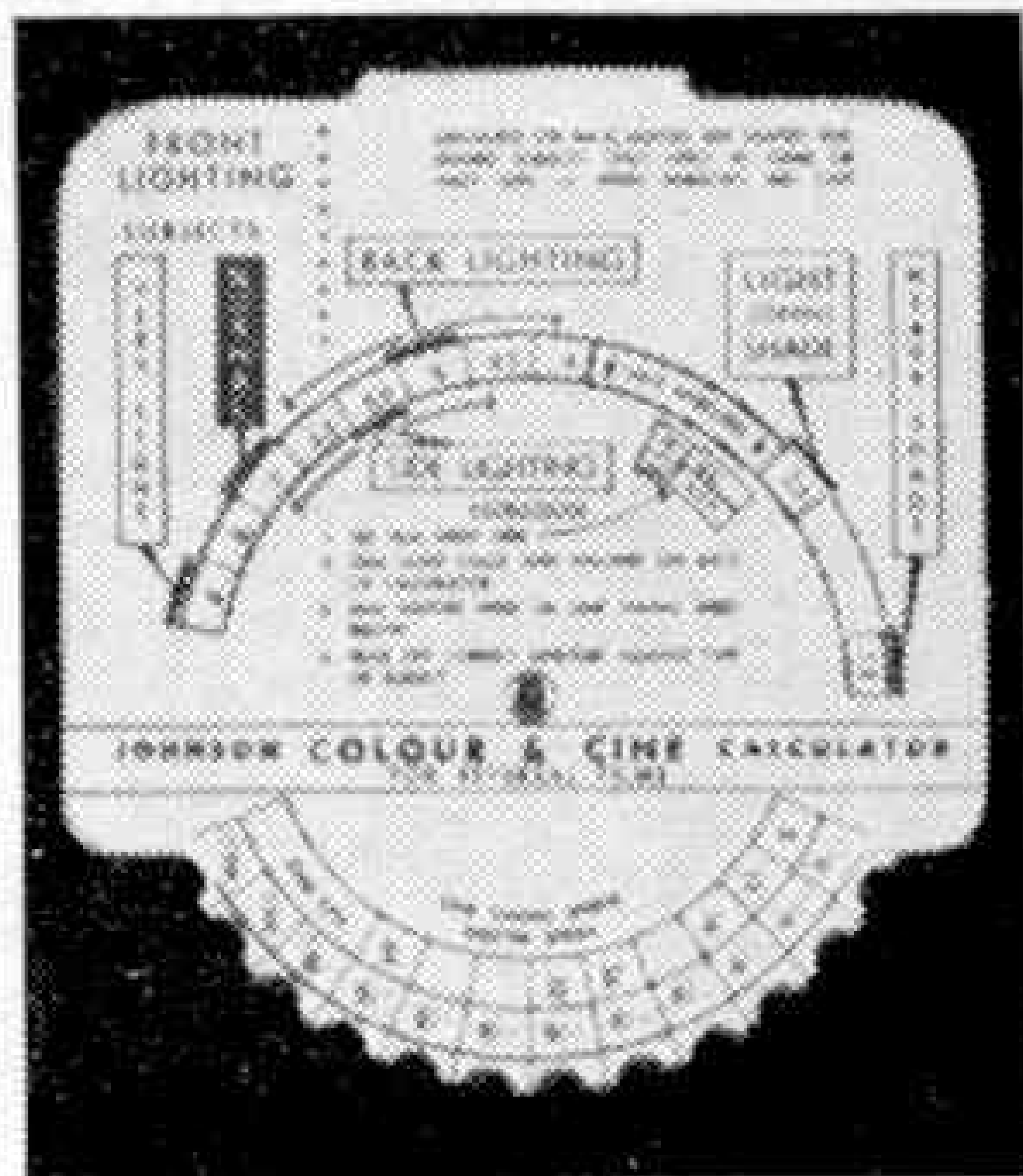
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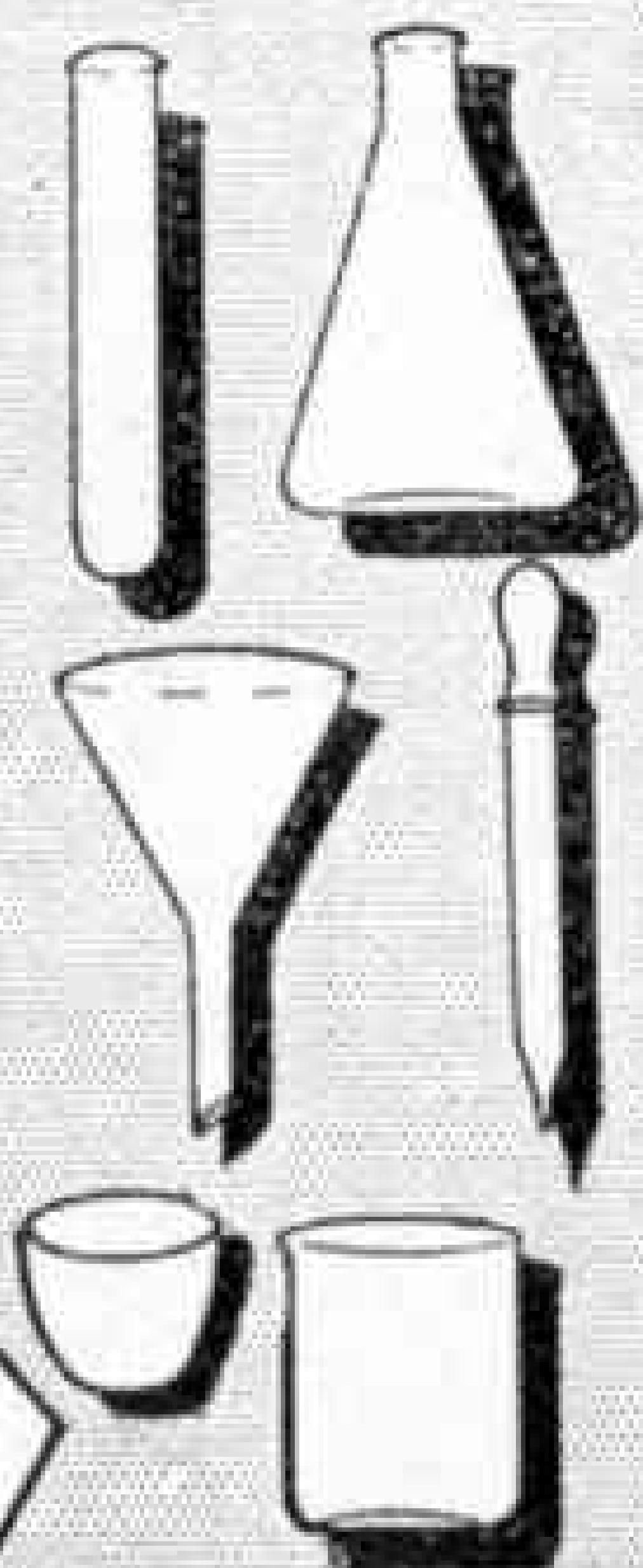
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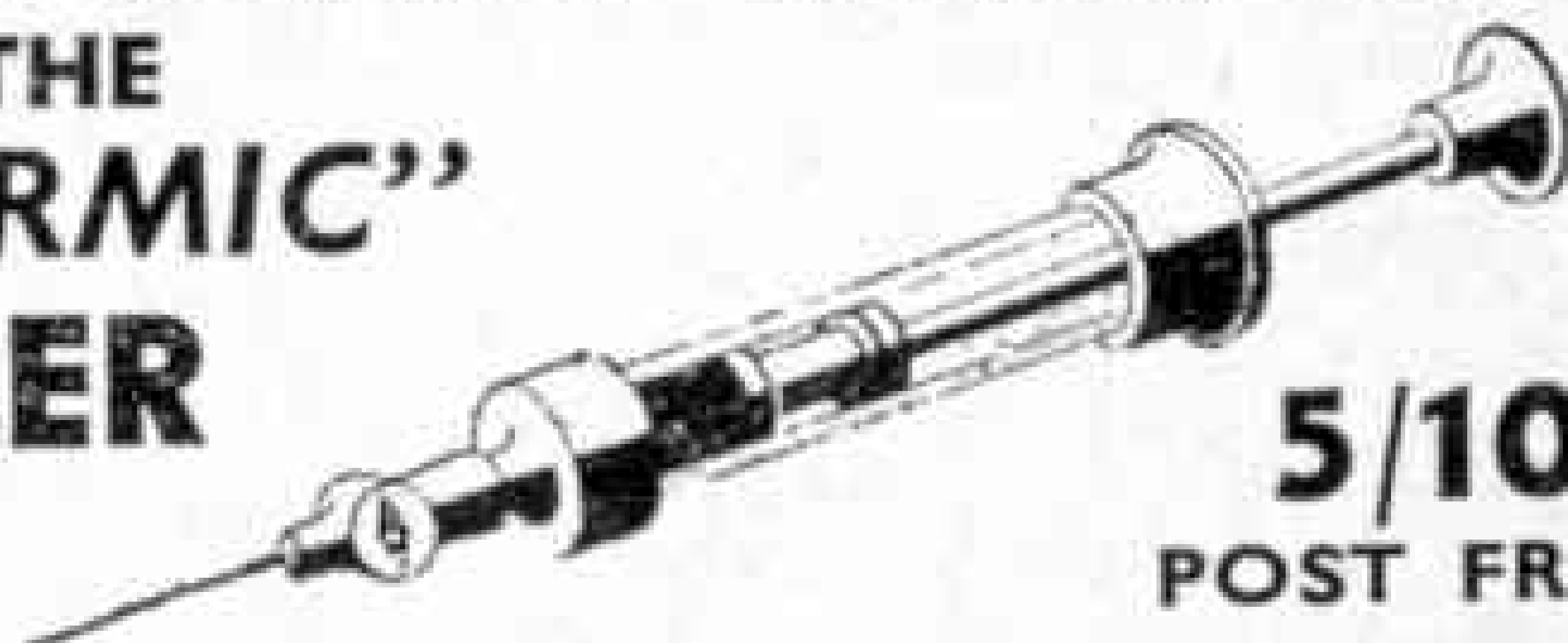
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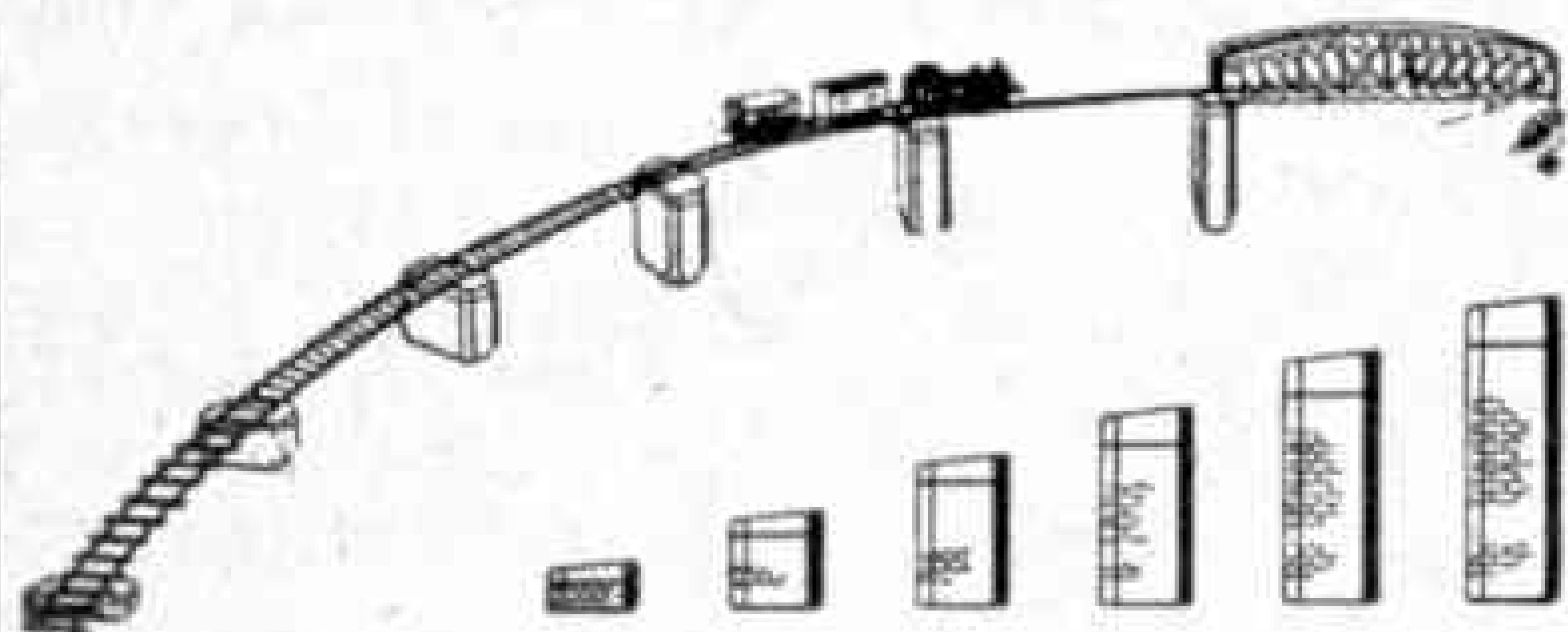
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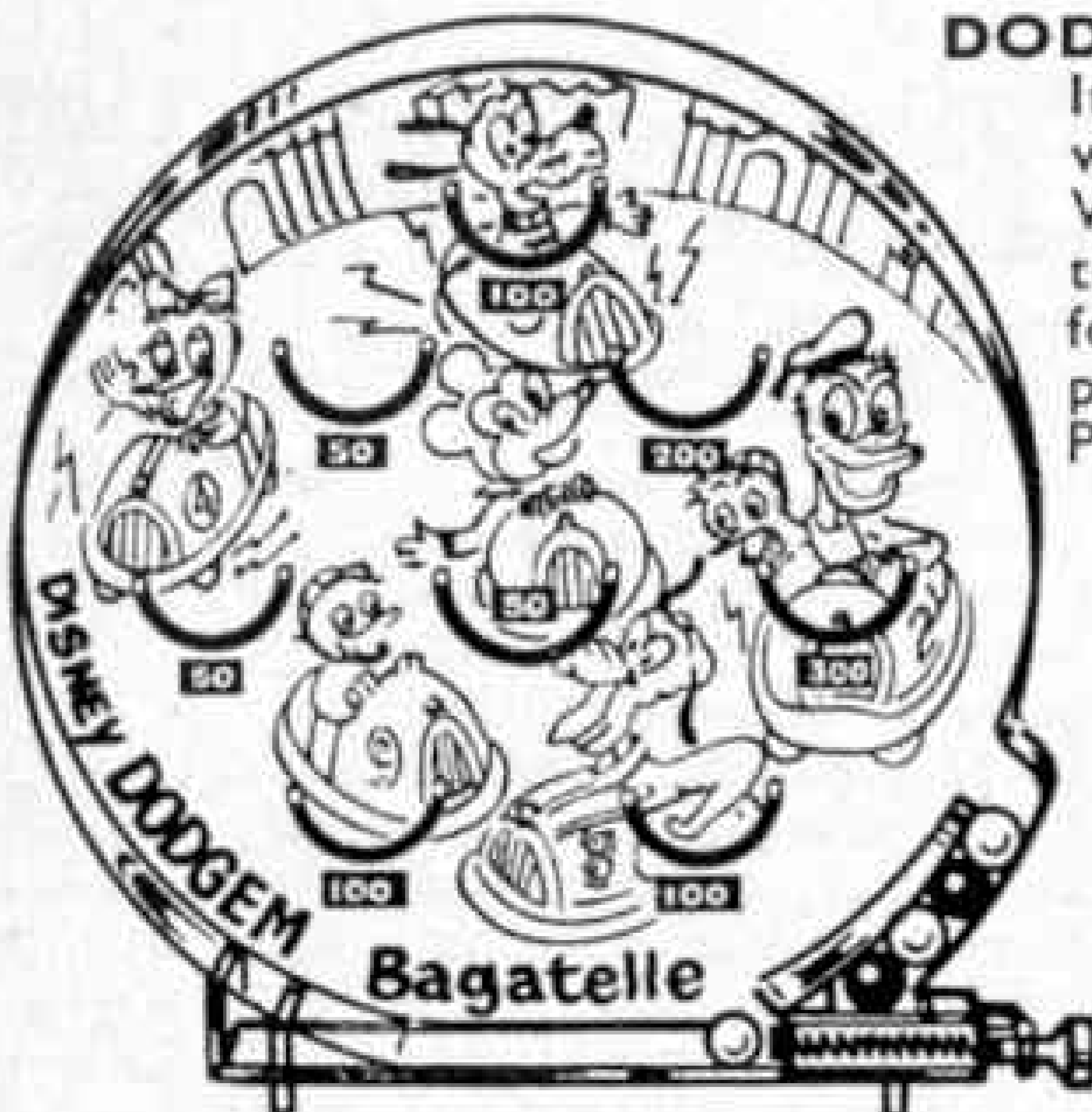
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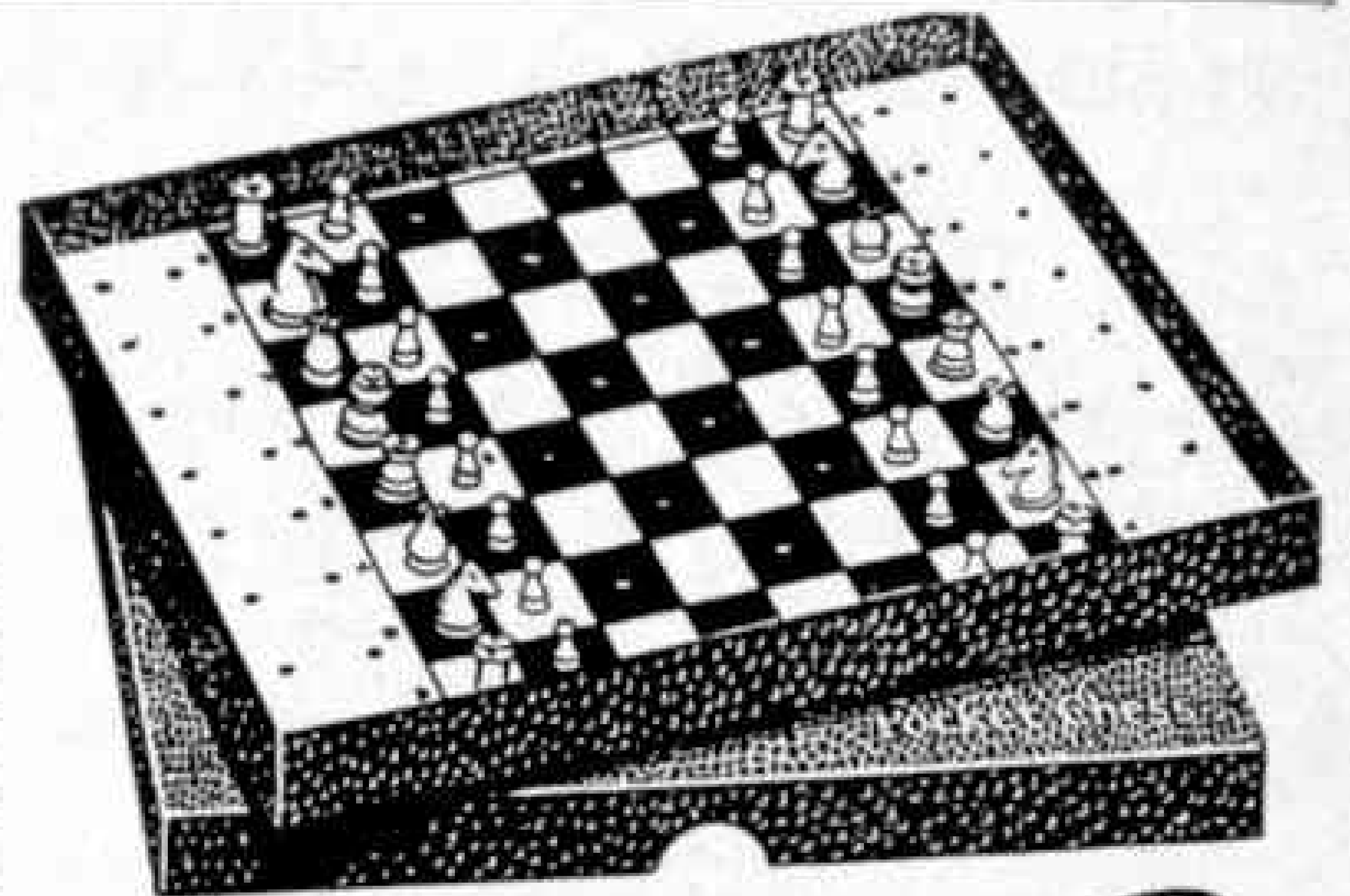
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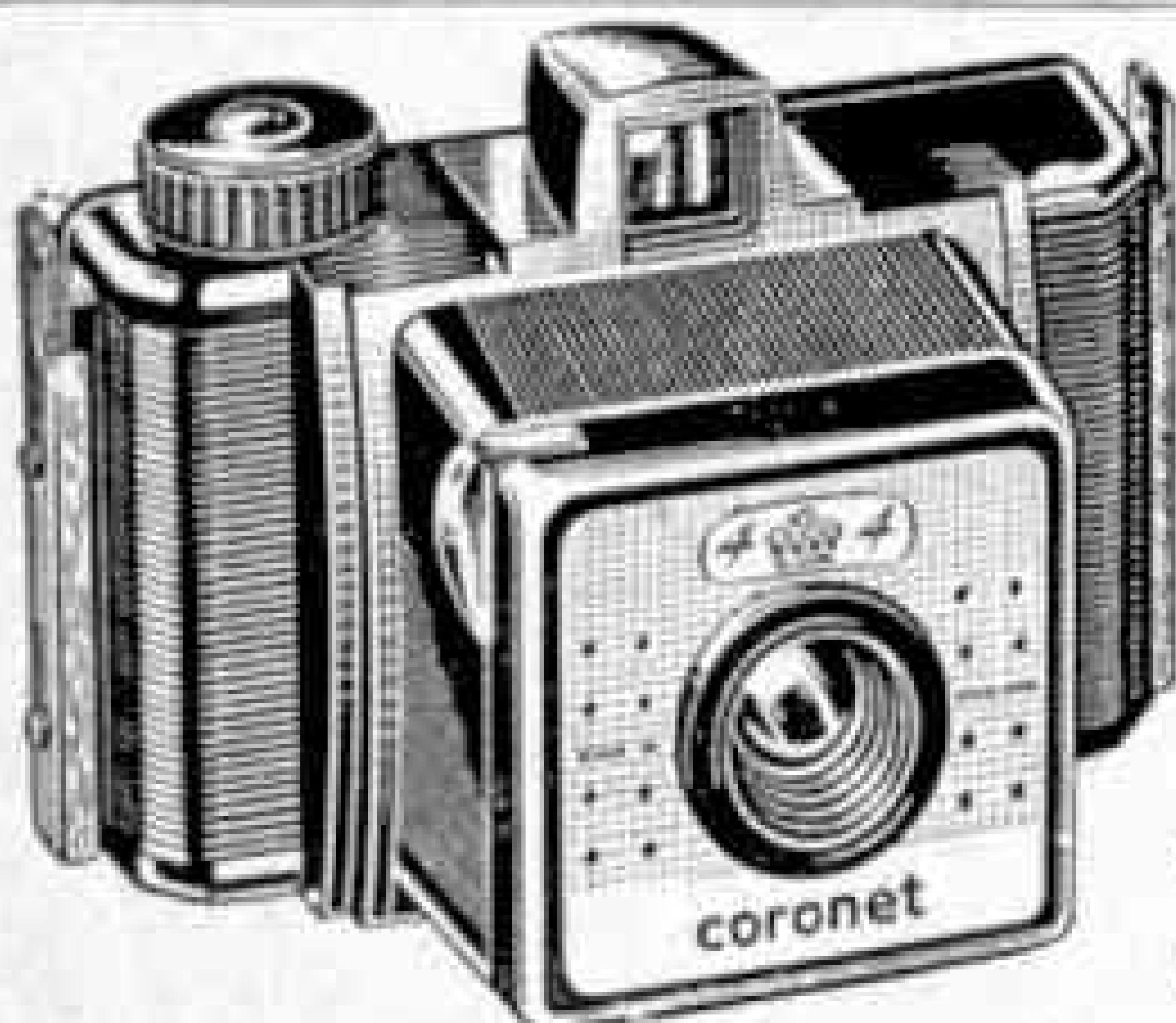


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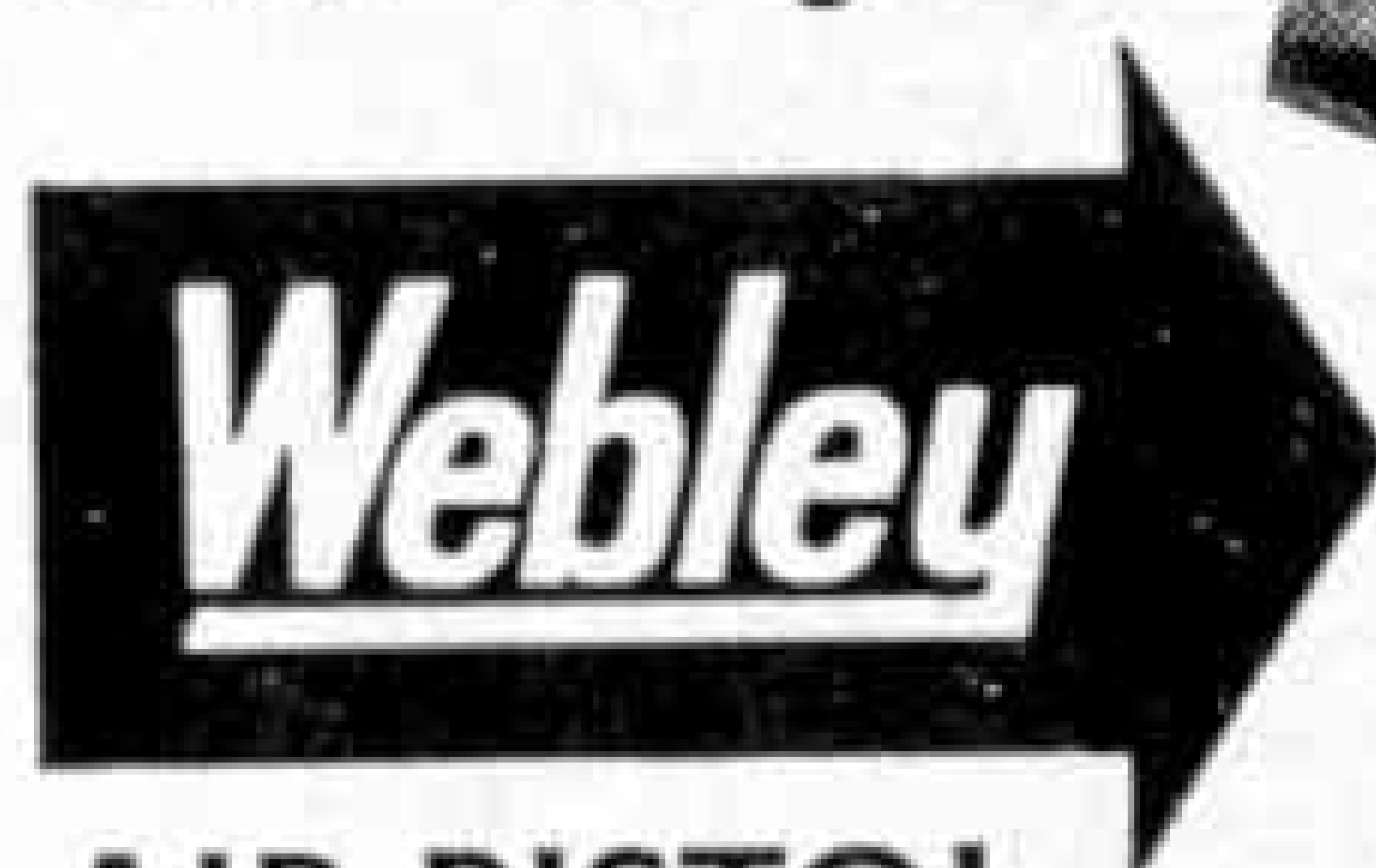
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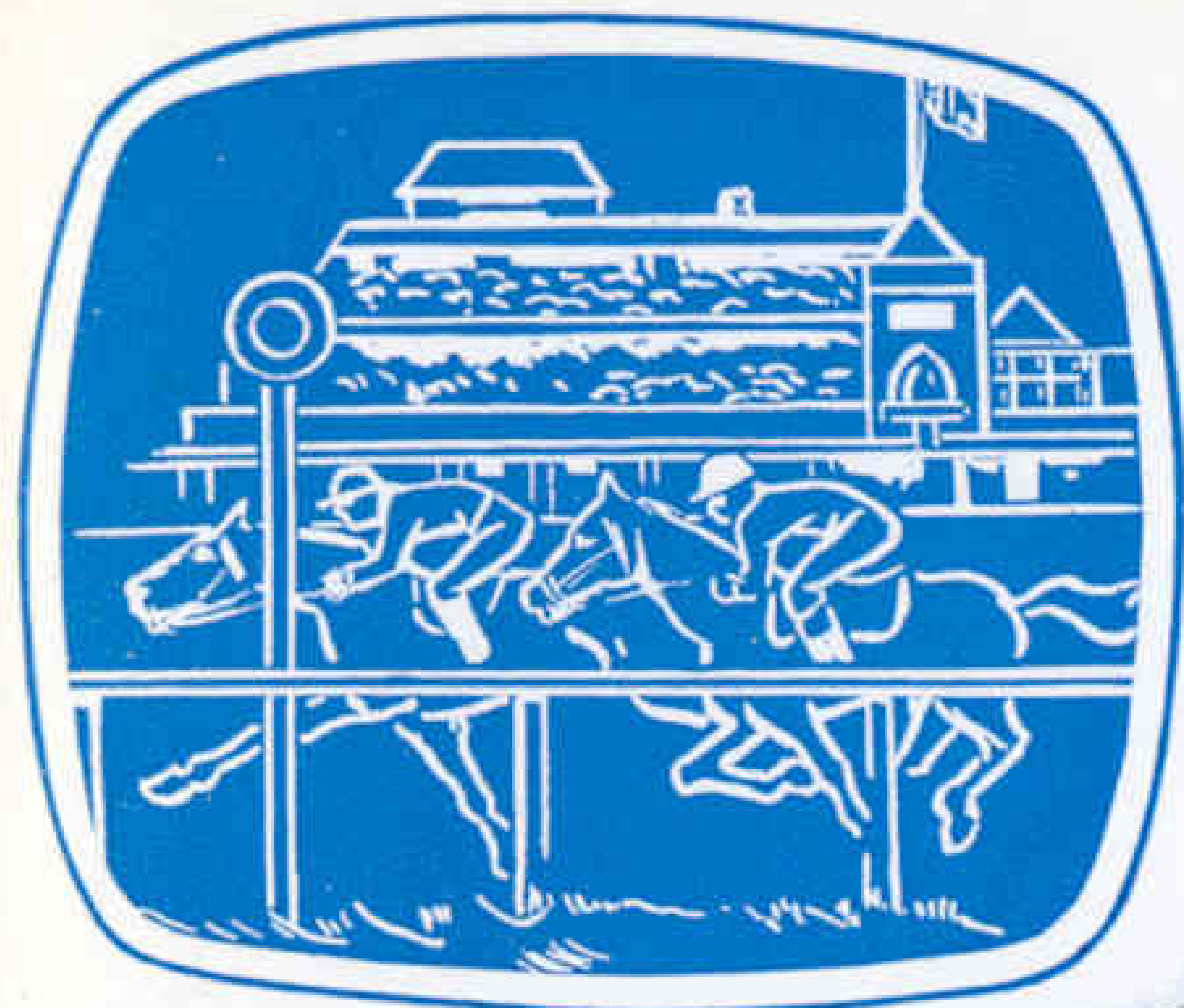
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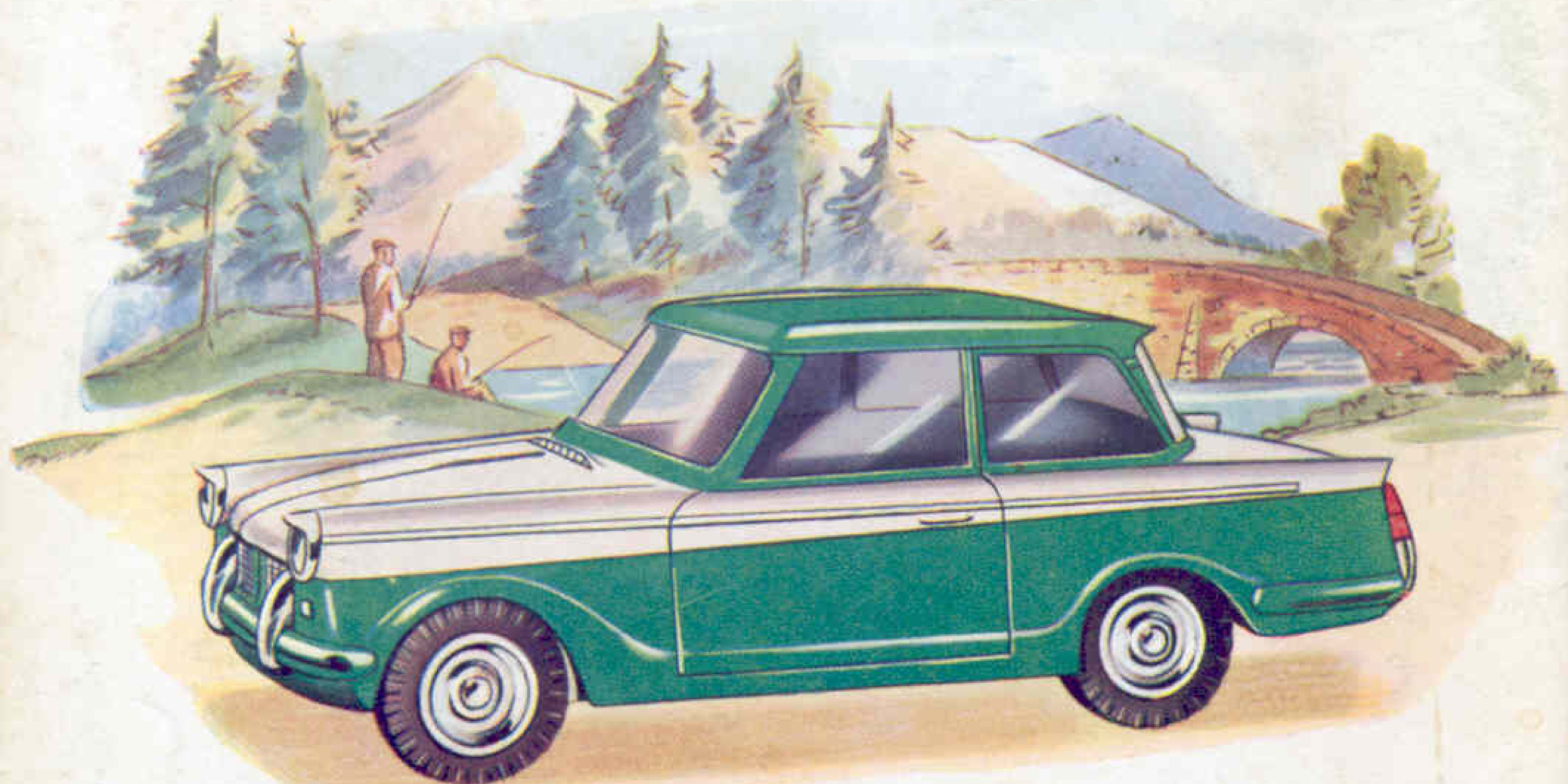
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